

DEPAUL  
UNIVERSITY

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## **Course Catalog**

**School of Computer Science Telecommunications**

**Winter/Spring 2007-2008**

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# General Information

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ General Information

## Catalog Version

### **GRADUATE UPDATE: OCTOBER 15, 2007**

Please use the menu items to the left for current catalog navigation. Access archived catalogs by choosing the link to the right.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ General Information □ Deans

## Deans

DAVID MILLER, PH.D.

Dean

GREGORY BREWSTER, PH.D.

Associate Dean

LUCIA DETTORI, PH.D.

Associate Dean

MARTIN KALIN, PH.D.

Associate Dean

LINDA V. KNIGHT, PH.D.

Associate Dean

Catalog Version

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ General Information □ Programs

## Programs

DOCTOR OF PHILOSOPHY

Computer Science

MASTER OF ARTS

Applied Technology

Information Technology

MASTER OF SCIENCE

Business Information Technology

Computational Finance

Computer Graphics and Animation

Computer, Information and Network Security

Computer Science

Distributed Systems

E-Commerce Technology

Human-Computer Interaction

Information Systems

Instructional Technology Systems

IT Project Management

Software Engineering

Telecommunication Systems

JURIS DOCTORATE AND MASTER OF ARTS

JURIS DOCTORATE AND MASTER OF SCIENCE

CONTINUING EDUCATION PROGRAMS

Advanced Software Development Professional

School of Computer Science, Telecommunications & Information Systems - Graduate Studies [General Information](#) [Courses](#)

## Courses

To obtain a Course Catalog for the Kellstadt Graduate School of Business call (312) 362-8810, for the College of Law call (312) 362-8701, or for Graduate Programs call (312) 362-5367.

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DePaul University does not discriminate on the basis of race, color, national origin, religion, gender, sexual orientation, age, or handicap in admissions, employment, or the provision of services. Inquiries regarding this policy should be addressed to the Director of Human Resources, DePaul University, 25 E. Jackson Boulevard, Chicago, Illinois 60604. Editor: John Glatz

**Note: The University reserves the right to revise its Course Catalogs and Schedules.**

School of Computer Science, Telecommunications & Information Systems - Graduate Studies [General Information](#) [Campus Locations](#)

## Campus Locations

The School of Computer Science, Telecommunications and Information Systems (CTI) offers courses at our Loop and Lincoln Park Campuses as well as at convenient suburban locations.

### LINCOLN PARK CAMPUS

2320 North Kenmore Avenue  
Chicago, Illinois 60614

### LOOP CAMPUS

243 South Wabash  
Chicago, Illinois 60604  
312-362-8381

*(full program of course offerings)*

### NAPERVILLE CAMPUS

150 West Warrenville Road  
Naperville, Illinois 60566  
*(selected course offerings)*

### OHARE CAMPUS

3166 River Road  
Des Plaines, Illinois 60018

*(selected course offerings)*

## **ROLLING MEADOWS CAMPUS**

2550 West Golf Road  
Meadows Corporate Center, East Tower  
Rolling Meadows, Illinois 60  
*(selected course offerings)*

Students may take courses at any of the locations. Currently all students must complete at least part of their degree program at the Loop Campus. However, as the University continues to expand the number and variety of courses at the suburban campuses, most students will be able to take increasing advantage of these locations.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies [□](#) General Information [□](#) Faculty

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Associate Professor  
Rutgers University

The School of Computer Science, Telecommunications and Information Systems (CTI) offers graduate level, professional education in these areas: artificial intelligence, collaborative technologies, computer science, computer graphics, computer vision, data analysis, database, data communications, data warehousing, distributed systems, e-commerce technology, human-computer interaction, information systems, management information systems, networking, project management, software engineering, systems foundation, systems development, telecommunication systems, and visual computing. Students choose from a broad collection of courses to develop, in depth, the research habits and practical skills needed for research and professional practice. The Schools programs are designed to provide its graduates with the technical competence and the flexibility necessary to respond to both present and future opportunities in the computing professions.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ General Information □ Facilities

## Facilities

DePaul University maintains an extensive technological infrastructure which is available for students, faculty and staff. In addition, many schools and departments maintain their own resources dedicated for use by their own constituents.

The School of CTI itself operates specialized laboratories in the following:

- Requirements Engineering Lab
- Mobile Commerce Lab
- Solid Objects and Graphics Lab
- Animation Lab
- Network Security Lab
- Game Development Lab
- Console Gaming Lab
- Digital Cinema Advanced Editing Lab
- High Definition Editing Suite
- Medical Informatics Lab
- Digital Cinema Studio
- Usability Testing Lab
- Intelligent Multimedia Processing Lab
- Supercomputing Cluster Lab
- Software Research Lab
- Multimedia Networking Lab
- Center for Web Intelligence
- E-Commerce Technology Lab

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ General Information □ Professional Development

## Professional Development

The School of Computer Science, Telecommunications and Information Systems established the Institute for Professional Development in 1985 to offer certificate programs designed to meet the needs of both individuals and businesses in the Chicagoland area. These non-degree offerings provide intensive training in a wide variety of areas, with each standalone certificate program addressing a different set of theoretical concepts and practical skills. Emphasis is placed on gaining practical experience through a combination of lectures and demonstrations complemented by laboratory exercises and homework assignments. Certificate programs are typically taught by a team of instructors, that includes both full-time faculty and part-time instructors from industry. The programs require a substantial commitment of time, as most meet two nights per week and in the morning on approximately half of the Saturdays during the program.

For application and registration information pertaining to the certificate programs offered by the Institute for Professional Development, please call the Institute office at (312) 362-6282.

Current certificate program offerings include:

**IPD 360/460 SQL Server Business Intelligence Program**

An 11-week in-depth program covering SQL Server 2005 analysis services, integration services, and reporting services

**IPD 361/461 SQL Server Database High Availability Program**

An 11-week comprehensive overview of the various high availability solutions available with the latest edition of Microsoft's SQL Server

**IPD 362 Open-Source Web Development Program**

A 5-week program addressing rapid and efficient development of business-critical Web applications using Linux, Apache, PostgreSQL and Python

**IPD 363 SQL Server Database Administration Program**

An 11-week in-depth program covering database administration using SQL Server

**IPD 364 Lightweight Java Web Development Program**

An 8-week comprehensive program covering open-source, lightweight Java enterprise Web development using POJOs (Plain Old Java Objects)

**IPD 365 Ruby on Rails Program**

A 7-week in-depth program covering Web development using Ruby on Rails

**IPD 370 Advanced SQL Program**

A 2-week program covering advanced SQL features

**IPD 380 IT Project Management Program**

A 10-week comprehensive program covering best practices in information systems project management

**IPD 390 Information Systems Security Management Program**

A 10-week comprehensive program covering best practices in designing, implementing and maintaining an organizational information security plan

**IPD 394 Java EE Developer Program**

A 10-week in-depth program covering enterprise-wide applications development using Java EE

**IPD 382 Java Developer Program**

A 10-week comprehensive program covering object-oriented applications development using Java

**IPD 366 Java Web Services Program**

A 7-week concentrated program covering service-oriented architecture and the development of Web services using Java

**IPD 389 .NET Developer Program**

A 10-week comprehensive program covering .NET technologies

**IPD 368/468 .NET Mobile Applications Development Program**

A 10-week focused program covering the basic skills and techniques for successfully building mobile applications using the .NET platform

**IPD 398 .NET Web Services Program**

An 8-week concentrated program covering service-oriented architecture and the development of Web services using the .NET platform

**IPD 392 Telecommunications Program**

An 11-week intensive program focusing on the configuration, implementation and ongoing support of telecommunications systems and networks

# Admission, Readmission, and Credit Transfer

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Admission, Readmission, and Credit Transfer

## **Admission and Readmission Procedures**

# Doctorates and Masters

## Doctor of Philosophy in Computer Science

School of Computer Science, Telecommunications & Information Systems - Graduate Studies ▢ Doctorates and Masters ▢ Doctor of Philosophy in Computer Science

### About

The Ph.D. program in Computer Science offers an opportunity for exceptional students to pursue substantial research in the computer sciences and related areas. The program is highly selective and is purposefully kept small so that each Ph.D. student can receive substantial advising and mentoring from CTI faculty. To earn a Ph.D. degree, a student must demonstrate breadth of knowledge in at least three research areas and significant depth in a chosen dissertation area. In addition, the student must conceive, write and defend a Ph.D. dissertation representing a significant and original contribution to current academic research as demonstrated by a public dissertation defense and publication in established peer-reviewed academic conferences and/or journals.

In keeping with the CTI philosophy of blending academic and professional pursuits, full-time employed students will be considered for admission as part-time doctoral students. However, these applicants must have sufficiently flexible work schedules to allow them to attend required meetings and academic seminars that occur during daytime working hours throughout their degree program. In addition, many working students will find that they must take a leave of absence or cut back to part-time employment for some time period during the research and candidacy phases of the degree program.

The deadlines to apply and submit all the required support documents are:

- October 1st for Winter
- January 15th for Autumn

School of Computer Science, Telecommunications & Information Systems - Graduate Studies ▢ Doctorates and Masters ▢ Doctor of Philosophy in Computer Science ▢ Admission Requirements

### Admission Requirements

In order to be considered for admission to the doctoral program, students must:

- Hold a masters degree in Computer Science or an allied field.
- Submit three letters of recommendation.
- Show definite promise for completing the program.
- Submit a written statement describing their accomplishments, goals and interests.
- Submit a completed application form.
- Submit an official score report of the Graduate Record

Examination (GRE) general examination. Applicants educated outside of the United States must demonstrate English proficiency with a TOEFL score of 580 or greater.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies ▢ Doctorates and Masters ▢ Doctor of Philosophy in Computer Science ▢ Guide to Applying for the PhD Program

## Guide to Applying for the PhD Program

\*\*\* GRE and TOEFL scores MUST be official copies sent directly by ETS. Photocopies CANNOT be accepted!

The Institution Code for the GRE and TOEFL is 1165

The Department Code for the GRE is 0402

The Department Code for the TOEFL is 78

Students without a masters degree in computer science or an allied field may be considered for conditional admission to the doctoral program. These students must have an exceptional undergraduate record. A conditionally admitted student will be required to complete a doctoral prerequisite phase consisting of a set of courses determined to be appropriate for the student by the Ph.D. committee. These courses will include the core courses from the Masters of Science in Computer Science program. Upon completion of the prerequisite phase, the Ph.D. committee will conduct an evaluation of the student's progress. Assuming such progress is satisfactory, the student will then be formally admitted into the doctoral program. Note: It is not the policy of the School to award a masters degree to a student enrolled in the Ph.D. program. The Ph.D. Admissions Committee determines which applicants will be admitted to the program. Because the School admits only a limited number of students to the Ph.D. program, meeting the admission standards does not guarantee acceptance. Students employed outside of the University can be admitted as part-time doctoral students. Students who can devote themselves full time to their doctoral studies can be admitted as full-time doctoral students. Only full-time students will be considered for substantial financial aid stipends.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies [□ Doctorates and Masters](#) [□ Doctor of Philosophy in Computer Science](#) [□ Completeness of Credentials](#)

### Completeness of Credentials

When important pieces of information such as transcripts are lacking, the school is compelled by University regulations to withdraw the application.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies [□ Doctorates and Masters](#) [□ Doctor of Philosophy in Computer Science](#) [□ Overview of the Degree](#)

### Overview of the Degree

The Doctor of Philosophy in Computer Science degree follows three phases, which may overlap in time:

**Inquiry Phase:** Coursework, initial research projects and successful completion of three Breadth Examinations.

**Research Phase:** Focused research leading to successful completion of a Dissertation Proposal. Upon completion of all requirements, the student is admitted to Candidacy.

**Candidacy Phase:** Further research, writing and defense of the Ph.D. dissertation.

**The Inquiry Phase** During the Inquiry Phase a student will complete coursework in various areas of Computer Science to gain breadth and to discover the area in which dissertation research is to be done. Since considerable thought should be given to choosing the area in which the student wishes to do research in the future, the student may wish to do small research projects during this time period to explore where their research interests lie. Three Breadth Examinations must be successfully completed. At least one of the 3 breadth exams must be in one of the core areas of computer science, namely, Artificial Intelligence, Database Systems, Operating Systems, Programming Languages, and Theoretical Computer Science. Furthermore, at least one breadth exam must be in the student's primary area of dissertation research. The choice of breadth exams must be approved by the student's PhD advisor. These examinations can be taken either during the Inquiry Phase or during the Research Phase. Each Breadth Examination will verify that the student has

knowledge sufficient to teach an introductory graduate course in that area. A student must pass all three breadth exams with at most one re-take opportunity per exam. Re-takes of breadth exams must be approved by the PhD Committee. A Ph.D. student enters the Research Phase when he or she has chosen an area in which to do dissertation research and has found a faculty member willing to act as his or her Dissertation Advisor. The amount of time spent in the Inquiry Phase will vary from student to student, but will typically be several years. The research phase may overlap with the inquiry phase, in fact, students are strongly encouraged to begin their research, under the supervision of a faculty PhD advisor, as early as possible upon entering the program.

**The Research Phase** In this phase the doctoral student, in conjunction with his or her Dissertation Advisor, will conduct extensive readings in academic texts, journals and conference proceedings to become an expert in the chosen research area. The student is responsible for approaching a faculty member to act as their Dissertation Advisor. The faculty member may request that the student perform additional projects or research before agreeing to be the Dissertation Advisor. The student and Dissertation Advisor then work together to choose three additional faculty which, together with the Dissertation Advisor, form the Dissertation Committee. Three of the members must be full-time faculty members in the School of Computer Science, Telecommunications and Information Systems. The fourth committee member must be a faculty member from outside the division of the research, or a scholar from outside the School of CTI whose expertise is pertinent to the topic of the dissertation. The members of this committee must be approved by the Schools Ph.D. Committee. Once the student has enough preliminary results that the student and advisor are confident that the work should result in publishable results, the student will write an extensive review of previous work in the area and a research proposal for the dissertation research. The Dissertation Committee members will then choose a date for a public defense of the dissertation proposal. The student will provide an oral presentation of current results and future research goals at this defense. The proposal will be approved only if the Dissertation Committee agrees that the work that is planned will constitute an acceptable Ph.D. dissertation. The committee may recommend that the student repeat the proposal at a later date. The dissertation committee may require additional components in conjunction with proposal defense to test the student's depth of knowledge in the specific area of dissertation research. A student generally enters the Candidacy Phase (and is considered a Candidate) after a successful defense of the Dissertation Proposal (see the full requirements for Candidacy below).

**The Candidacy Phase** In the Candidacy Phase the student performs the research promised in the dissertation proposal and writes the dissertation. Ph.D. dissertations in Computer Science are typically 100 to 300 pages in length and must represent a significant and original body of work. Except in very unusual situations, the student will be required to publish some portion of the dissertation as an academic paper in a refereed journal or conference before completing the degree. This will demonstrate that the significance of this work is recognized in academic communities outside DePaul University. After the dissertation has been written, the student will provide a copy to all members of the Dissertation Committee. After reading the dissertation, the Dissertation Committee must recommend whether or not a public dissertation defense should proceed. In particular, the members of the Dissertation Committee will determine whether the completed dissertation embodies the work that was promised in the dissertation proposal. The committee may recommend modifications or additional research to be completed before the defense can take place. Once the Dissertation Committee agrees that the defense should take place, a date will be scheduled for the dissertation defense. After the defense, the Dissertation Committee will determine whether all work has been satisfactorily completed or additional work or modifications must be made. A bound copy of the dissertation and the abstract must be presented to the DePaul Library where it will be permanently available to current and future DePaul students. Consult the Handbook for Graduate Studies at the back of this bulletin for information on submitting the dissertation and abstract to the School. Contact the Student Services office for additional information regarding procedures to follow for binding the dissertation.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Doctor of Philosophy in Computer Science □ Detailed Course Requirements

## Detailed Course Requirements

**Course Requirements** Ph.D. students with a masters degree are required to complete a minimum of 60 credits (typically 15 courses) of graduate classes. These credits must include at least 48 credits of courses in the 420-599 range, including CSC 426 Values and Computer Technology, and 12 credits of CSC 699 Research. Students may enroll in CSC 699 only after completion of the Breadth Examinations. Conditionally admitted students must complete an additional 52 credits (typically 13 courses) of graduate classes, including at least



36 credits of courses in the 420-599 range. The written approval of the Ph.D. Committee is required, before registering, to apply courses taught outside the School towards the doctoral program course requirements. Student progress will be evaluated annually. Students must maintain a grade point average of 3.5 or better to remain in good standing in the program. Any course grade below B- is unsatisfactory and will not be counted toward degree requirements. The Ph.D. Committee will ask a student to withdraw from the doctoral program if the members judge that that student is not progressing satisfactorily toward the degree.

**Continuous Enrollment** Prior to candidacy, a student must continuously enroll for at least one academic credit per quarter during every Autumn, Winter and Spring quarter. A student may apply to the Ph.D. committee for a leave of absence from this continuous enrollment requirement if exceptional circumstances arise. After admission to candidacy, a student must continuously enroll for at least one course per quarter during every Autumn, Winter and Spring quarter, but may enroll for CSC 701 Candidacy Continuation (0 academic credits) with advisors approval.

**Admission to Candidacy** To be admitted to candidacy, doctoral students must complete the following:  
Residency: Three quarters of full-time study must be completed at DePaul University beyond the masters level. Full-time study is defined as registration for a minimum of eight credit hours (typically two courses) per quarter. With prior approval of the Ph.D. Committee, students may satisfy residency requirements by coursework, participation in seminars, or research performed off campus.  
Allied Course: Complete CSC 426 Values and Computer Technology.  
Doctoral Examinations: Pass three Breadth Examinations.  
Defense of Proposal: Successfully defend a Dissertation Proposal.

**Doctoral Examinations** Breadth examinations are typically offered twice each year. Applications to take these exams must be completed three months prior to the exam date. At least one of the 3 breadth exams must be in one of the core areas of computer science, namely, Artificial Intelligence, Database Systems, Operating Systems, Programming Languages, and Theoretical Computer Science. Furthermore, at least one breadth exam must be in the student's primary area of dissertation research. The choice of breadth exams must be approved by the student's PhD advisor. Must pass all three breadth exams with at most one re-take opportunity per exam. Requests to re-take one or more breadth exams must be approved by the PhD Committee. Any student who fails to satisfy the breadth exam requirements will be asked to leave the program. Reading lists and copies of previous Breadth examinations are available. The reading list for each examination defines the specific subject areas covered by that examination. Examinations are offered in each of the following areas:

- Artificial Intelligence
- Communications Networks
- Computer Graphics
- E-commerce Technology
- Theoretical Computer Science
- Information Systems
- Data Analysis
- Database Systems
- Human Computer Interaction
- Operating Systems
- Visual Computing
- Programming Languages
- Software Engineering
- Software Management

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Doctor of Philosophy in Computer Science □ Program Time Limitations

## **Program Time Limitations**

**For part-time doctoral students, time limits are as follows:**

No more than four years between admission to the doctoral program and completion of Breadth Examinations.  
No more than two years between completion of Breadth Examinations and admission to Candidacy.

No less than eight months and no more than five years between admission to Candidacy and the dissertation defense.

**For full-time doctoral students, time limits are as follows:**

No more than three years between admission to the doctoral program and completion of Breadth Examinations.

No more than two years between completion of Breadth Examinations and admission to Candidacy. No less than eight months and no more than five years between admission to Candidacy and the dissertation defense.

Consult the Handbook for Graduate Studies at the back of this bulletin for graduation application deadlines and the deadline for submitting completed dissertations.

## Master of Science in Applied Technology

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Applied Technology

### About

The **Master of Science in Applied Technology (MSAT)** is designed for experienced non-IT managers who wish to acquire advanced technical skills in a highly focused area, in combination with enhanced understanding of the larger organizational, economic, and social contexts within which these technical skills are practiced.

The MSAT offers Areas of Specialization in either Applied Information Systems (AIS) or Applied Telecommunications Systems (ATS). This new degree program is being offered jointly by CTI and the School for New Learning (SNL), DePaul's nationally recognized college for adult learners; and students work with advisors from both colleges throughout their program.

Students entering the MAAT must have an undergraduate degree with an appropriate GPA, although it need not have been in a technology-related field. They must also have had experience in the workplace sufficient to define the technological requirements of an organization as well as to understand the organizational system itself (generally, at least three years), and must have access to a worksite "laboratory" within which the application of learning can take place.

Prospective students can find more information on this degree at the SNL website:  
[http://snl.depaul.edu/prospective/maat\\_index.asp](http://snl.depaul.edu/prospective/maat_index.asp)

The curriculum consists of three primary components:

- An individualized Area of Specialization in either Applied Information Systems or Applied Telecommunications Systems offered through CTI; the Area of Specialization combines CTI coursework with on-the-job application of this coursework.
- A series of Liberal Learning Seminars offered through SNL which are designed to develop the skills of communication, interpersonal facility, problem-solving, analytical and systems thinking, ethical decision-making, and self-managed learning.
- A Culminating Project which is designed to integrate the technical and liberal learning components of the program through the design and/or implementation of a major professional project in the workplace.

This degree is administered by the School for New Learning. Please see their catalog entry for current requirements.

## Master of Science in Business Information Technology

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of

## About

The **Master of Science in Business Information Technology** is a joint degree between School of Computer Science, Telecommunications and Information Systems (CTI) and the Kellstadt Graduate School of Business (KGSB).

The **Master of Science in Business Information Technology** program addresses today's need for individuals who understand the core principles of both business and technology in corporations, health care institutions, and government agencies. Many of these people work as liaisons between the Information Technology department and a functional business unit. Others work within departments that are information dependent and rely heavily on information technology.

The M.S. in Business Information Technology also provides a solid base for those interested in moving their career forward through project management or information technology management positions.

Admissions

Degree Program and Required Courses

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Business Information Technology □ Admissions

## Admissions

Your Application: Accepted throughout the Year.

Students are admitted to the MS in Business Information Technology throughout the year. Applicants must choose to apply through only one of the two schools. Students applying through the school of CTI must possess a bachelor's degree from a regionally accredited institution (or be in the final stages of completing the undergraduate degree). The primary criterion in determining eligibility for admission is previous academic achievement. Other factors, such as work experience and career progression, are also important and will be considered for admission. Thus, although not required, applicants may wish to include letters of recommendation, a resume and other supporting material which they feel may give an Admissions officer a broader view of their achievements. International students are required to submit a recent (no more than two years old) TOEFL score.

To review application requirements, please go to:

[http://www.cs.depaul.edu/Admissions/admissions/admissions\\_gRequirements.asp](http://www.cs.depaul.edu/Admissions/admissions/admissions_gRequirements.asp)

Or to apply online:

[https://www.cs.depaul.edu/admissions/admissions/admissions\\_apply.asp](https://www.cs.depaul.edu/admissions/admissions/admissions_apply.asp)

This masters program does not require an admissions test. Please note that if you choose to apply through the Kellstadt School of Business, you will be required to submit a GMAT score.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Business Information Technology □ Degree Program and Required Courses

## Degree Program and Required Courses

### Degree Program Courses

There is a single prerequisite course, IT 130 The Internet and the Web, which can be waived based on discussion with a CTI or KGSB advisor.

## **Required Courses (10)**

### **Courses (5) from the Kellstadt Graduate School of Business**

ACC 500 Financial Accounting  
MGT 502 Managing Operations for Competitive Advantage  
MIS 555 Management of Information Technology  
MIS 674 Systems Analysis and Design  
MKT 555 Decisions in Marketing Management

### **Courses (5) from the School of CTI**

CSC 451 Database Design  
IS 572 Information Security Management  
IT 430 Building Internet Applications  
SE 477 Software and Systems Project Management  
TDC 425 Voice/Data Network Fundamentals

### **Electives (3)**

Three electives, with one chosen from the business school, one chosen from the School of CTI, and one chosen from either the business school or from CTI:

#### **Business school courses available for use as electives: (choose 1)**

ACC535 Accounting Systems  
ACC555 Management Accounting for Decision Making  
MGT501 Strategic Supply Chain Management  
MGT502 Managing Operations for Competitive Advantage  
MGT506 Decision Making for Managers  
MGT570 Entrepreneurship and New Venture Management  
MIS 680 Electronic Business  
MIS 681 E-Business Strategies  
MIS 683 Information Technology Strategy and Architecture  
MIS 689 Knowledge Management  
MIS 798 Special Topics  
MIS 799 Independent Study  
MKT595 Internet Marketing

#### **CTI courses available for use as electives: (choose 1)**

CSC 599 Topics in Computer Science  
ECT 596 Topics in E-Commerce Technology  
HCI 422 Multimedia  
HCI 440 Usability Engineering  
HCI 454 Interaction Design  
IPD 499 Topics in Global Information Technology  
IS 450 Enterprise System Implementation.  
IS 482 Legal Aspects of Information Technology  
IS 505 Business Continuity and Disaster Recovery  
IS 511 Social Issues of Computing  
IS 512 Groupware and Virtual Collaboration  
IS 540 Global Information Technology  
IS 574 Decision Support Systems and Intelligent Systems  
IS 578 Information Technology Consulting  
IS 596 Topics in Information Systems  
IT 498 Topics in Global Information Technology  
SE 427 Software Quality Management  
TDC 463 Computer Networks and Data Systems

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## Grade and GPA requirements

**Grades:** Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.

**GPA:** Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.75 or higher and a designation of distinction on at least two core examinations and no failed core examination will graduate with distinction.

# Master of Science in Computer Graphics and Motion Technology

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer Graphics and Motion Technology

## About

The **MS in Computer Graphics and Motion Technology** is a study of the technical and aesthetic foundations, design and development of Computer Graphics. This program prepares students for technical careers in the graphics industry.

### What Students Will Learn From The Program

- Develop a sensitivity to human perception, including a comprehension of fundamental design concepts, color theory, and the interaction of light with surfaces
- Build a deep understanding of such technical concepts as interaction design, modeling objects, controlling cameras, rigging characters for animation and using particle and surface techniques
- Learn to apply perceptual and technical abilities in creating shaders, textures, characters, scenes and animations
- Acquire hands-on experience with a wide range of commercially-available tools
- Develop a grasp of fundamentals that allow implementations beyond the extant user interfaces
- Become appreciative of the two cultures of computer graphics the one drawing on communication design and the other deriving from computer science.

### Concentrations

The degree program offers two concentrations: a **Technical Director concentration** and a **Developer concentration**. While both concentrations have a balance of technical and aesthetic, the Technical Director will have a greater emphasis on the aesthetic while the Developer concentration will focus on the technical.

After graduation, Technical Directors will be ready for jobs assisting Creative Directors in such activities as creating virtual sets, adjusting lighting and rigging characters for animation. Developers will learn technologies for graphics systems development, including game engines and plug-ins.

### Course Requirements

The MS in Computer Graphics and Motion Technology program consists of 13 courses with six or seven prerequisite courses. Students choosing the Technical Director concentration take six courses while students taking the Developer concentration take seven courses.

Grade and GPA requirements

Prerequisite Phase

Fundamental Phase

Core Phase

Advanced Phase

Elective Courses

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer Graphics and Motion Technology □ Grade and GPA requirements

## Grade and GPA requirements

**Grades:** Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.

**GPA:** Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.85 or higher will graduate with distinction.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer Graphics and Motion Technology □ Prerequisite Phase

## Prerequisite Phase

The courses in the Prerequisite Phase for the MS in Computer Graphics and Motion Technology are:

### Both concentrations

HCI 402 Foundations of Digital Design

GPH 212 Perceptual Principles for Digital Environments II

IT 240 Introduction to Desktop Databases [Self Placement Test Available!](#)

### Technical Director concentration \*

CSC 211 Programming in Java I [Self Placement Test Available!](#)

or CSC 261 Programming Languages I: C/C++

CSC 212 Programming in Java II

or CSC 262 Programming Languages II: C/C++

or CSC 224 Java for Programmers

or CSC 396 Programming in Java I and II

GPH 259 Design Geometry

### Developer Concentration

CSC 261 Programming Languages I: C/C++

CSC 262 Programming Languages II: C/C++

CSC 393 Data Structures in C++

MAT 150 Calculus I

\* The Technical Director prerequisite track requires two quarters of programming in either Java or C/C++ so students entering with prior coursework in C++ will satisfy this requirement. Any TD student who wishes to eventually take courses in the Developer track as electives are encouraged to take the C++ programming track CSC 261 and CSC 262 to satisfy their prerequisite programming requirement.

By taking these courses and receiving a grade of a B- or better in each, the student will have completed the requirements of the Prerequisite Phase. All or part of the Prerequisite Phase may be waived if a student has the equivalent academic background. Alternatively, students with practical experience may complete a

Graduate Assessment Examination (GAE) to show competency in a prerequisite. All students are blocked from enrolling in Foundation Phase courses prior to completing their prerequisites. The student must submit an online Change of Status request when the Prerequisite Phase is completed to inform the Student Services offices that the block can be removed. The online request must be submitted two weeks before the student intends to register for graduate level classes. The student will then be considered a fully admitted student, and may pass to the Graduate Phase of the program. Students may submit the Change of Status request by logging in to MyCTI.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer Graphics and Motion Technology □ Fundamental Phase

## **Fundamental Phase**

The courses in the Fundamental Phase for the MS in Computer Graphics and Motion Technology are:

HCI 470 Digital Page Formatting I  
GPH 425 Survey of Computer Graphics  
GPH 438 Computer Animation Survey  
GPH 448 Computer Graphics Scripting

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer Graphics and Motion Technology □ Core Phase

## **Core Phase**

The Core Knowledge Phase courses for the MS in Computer Graphics and Motion Technology are:

### **Technical Directors concentration**

GPH 450 Digital Modeling I  
HCI 422 Multimedia  
GPH 560 Modeling Spaces  
HCI 440 Usability Engineering

### **Developers concentration**

GPH 436 Fundamentals of Computer Graphics  
GPH 469 Computer Graphics Development  
GPH 572 Principles of Computer Animation

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer Graphics and Motion Technology □ Advanced Phase

## **Advanced Phase**

The Advanced Phase courses for the MS in Computer Graphics and Motion Technology are:

### **Both concentrations**

GPH 539 Advanced Rendering Techniques

### **Technical Directors concentration**

GPH 565 Designing for Visualization

### **Developers concentration**

GPH 570 Visualization

GPH 580 Hardware Shading Techniques

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer Graphics and Motion Technology □ Elective Courses

## **Elective Courses**

*Three electives* must be taken in the following areas. Elective courses must not have been otherwise used to satisfy degree requirements.

- 1 GPH Course, 420 level or above
- 2 CTI Courses, 420 level or above

## Master of Science in Computational Finance

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computational Finance

### **About**

The Master of Science in Computational Finance is a joint degree between School of Computer Science, Telecommunications and Information Systems (CTI) and the Kellstadt Graduate School of Business (KGSB).

The objective of this program is to offer students the opportunity to acquire both the ability to understand existing financial models in a quantitative and mathematical way, and the ability to implement these models in the form of computer programs. This program differs from a regular MS in Finance because of a stronger mathematical component and the addition of an intensive computational component. The program aims to produce graduates with the required qualifications to become "quantitative financial analysts". The Computational Finance graduates will be able to apply these quantitative tools to solve complex problems in the areas of portfolio management, risk management, and financial engineering. **Note: Students who choose to apply to the MS in Computational Finance program must submit GMAT or GRE scores.**

Find out more at the Computational Finance Website: <http://www.cti.depaul.edu/programs/cf/>

Admissions

Prerequisites Course

Required Courses



## Admissions

Students are admitted to the MS in Computational Finance throughout the year.

Admission to this joint program is open to both students from the School of CTI and the College of Commerce. All applicants must: have successfully completed a bachelor's degree from an accredited four year United States institution, or its equivalent; have a minimum 3.2 GPA earned during the junior and senior academic years; submit a GMAT or a GRE score. International students also must submit a TOEFL score.

Students who choose to apply to the business school must submit their scores on the Graduate Management Admissions Test (GMAT). Upon completion of all requirements, these students will receive their M.S. degree from the Kellstadt Graduate School of Business.

**Students who chose to apply to the School of CTI must submit GMAT or GRE scores.** Upon completion of all requirements, these students will receive their M.S. degree.

## Prerequisites Course

Choose a three-course calculus sequence:

MAT 150 Calculus I

and MAT 151 Calculus II

OR

MAT 160 Calculus for Mathematics and Science Majors I

and MAT 161 Calculus for Mathematics and Science Majors II

OR

MAT 170 Calculus I with Scientific Applications

and MAT 171 Calculus II with Scientific Applications

CSC 261 Programming Languages I: C/C++

and CSC 262 Programming Languages II: C/C++

or CSC 309 Object-Oriented Programming in C++

CSC 202 Discrete Structures for Computer Science

or CSC 321 Design and Analysis of Algorithms

AND

GRE or GMAT

## Required Courses

*Courses (7) from the Kellstadt Graduate School of Business*

ACC 500 Financial Accounting  
ECO 555 Economics for Decision-Making  
FIN 555 Financial Management  
FIN 523 Investment Analysis  
FIN 525 Portfolio Management  
FIN 562 Derivatives : Pricing and Risk Management  
FIN 662 Advanced Derivatives: Pricing and Applications

*Courses (5) from the School of CTI*

CSC 423 Data Analysis and Regression  
CSC 425 Time Series Analysis and Forecasting  
CSC 431 Scientific Computing  
or CSC 485 Numerical Analysis  
CSC 521 Monte Carlo Simulations: Algorithms and Applications  
CSC 696 Master's Research  
or CSC 697 Graduate Internship  
or CSC 559 Software Project: Developing Financial Engines

One elective chosen from any 500 level course in the School of CTI.

Electives (1)

## Grade and GPA Requirements

**Grades :** Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.

**GPA :** Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.75 or higher will graduate with distinction

## Master of Science in Computer Science

### About

The **Master of Science degree in Computer Science** prepares professionals to apply key concepts, techniques, structures and algorithms of computer science to improve the performance of current computer applications and develop new applications for computer systems.

The **MS in Computer Science** degree is appropriate for students who wish to pursue a technical career in any of

a number of areas within Computer Science, or for students who wish to pursue a Ph.D. degree in the future.

The Master of Science in Computer Science program at DePaul CTI is structured to provide students an expertise in the following **core areas**:

- Algorithm development and Computer Science concepts
- Computer systems
- Programming and software development.

The program also allows students flexibility to apply the core knowledge to diverse **applied areas** :

- distributed systems and web development
- database systems
- data analysis
- data mining
- bioinformatics
- artificial intelligence and computer vision
- computer graphics
- computer games and animation
- software engineering and user interfaces
- networking and security

### **What Students Learn From The Computer Science Program**

- Knowledge of key computer science concepts, techniques and algorithms.
- An understanding of the workings and the API (Application Programming Interface) of modern computer systems.
- Expertise in programming and software development.
- Skills in your choice of application areas.
- Research skills and experiences that can be applied in any endeavor, including pursuing a Ph.

### **Program Information**

The program follows a three-phase sequence, with each phase preparing the student for the subsequent phase:

- A. Prerequisite Phase
- B. Foundations Phase
- C. Advanced Phase

The goal of the prerequisite phase is to give students the background in programming, mathematics, data structures and computer systems that is necessary for starting the graduate program. Upon acceptance into the masters degree program, the student will meet with their faculty advisor to discuss required courses for the prerequisite phase. While completing this phase, a student is considered a conditionally admitted masters student. Typically, a student with a Bachelor of Science in Computer Science will be waived from this phase.

The foundations phase consists of three graduate courses that provide the foundation in the three core areas of algorithm development, computer systems and software development.

The goal of the advanced phase is to further the student's expertise in these core areas through additional coursework in Computer Science Concepts and Computer Systems, with an emphasis on Software Development throughout, and to expand the student's expertise to other areas in Computer Science. The second part of the advanced phase gives students a great deal of flexibility. A student may choose to focus in a specific area by taking many courses in one area of computer science or to achieve a breadth of knowledge by selecting courses from a variety of areas. This degree is appropriate for students who wish to pursue a professional career in any of a number of areas of Computer Science, or for students who may wish to pursue a Ph.D. degree in the future.

Grade and GPA requirements

Prerequisite Phase

Foundations Phase

Advanced Phase

Masters Research

Master's Independent Study

Master's Thesis

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer Science □ Grade and GPA requirements

## Grade and GPA requirements

**Grades** : Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.

**GPA** : Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.90 or higher will graduate with distinction.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer Science □ Prerequisite Phase

## Prerequisite Phase

The courses in the Prerequisite Phase are:

CSC 202 Discrete Structures for Computer Science  
CSC 211 Programming in Java I [Self Placement Test Available!](#)  
and CSC 212 Programming in Java II  
or CSC 224 Java for Programmers [Self Placement Test Available!](#)  
or CSC 396 Programming in Java I and II  
CSC 373 Computer Systems I  
CSC 374 Computer Systems II  
CSC 383 Data Structures and Algorithms in Java

By taking these courses and receiving a grade of a B- or better in each, the student will have completed the requirements of the Prerequisite Phase. All or part of the Prerequisite Phase may be waived if a student has the equivalent academic background. Alternatively, students with practical experience may complete a Graduate Assessment Examination (GAE) to show competency in a prerequisite. All students are blocked from enrolling in Core Knowledge Phase courses prior to completing their prerequisites. The student must submit an online Change of Status request when the Prerequisite Phase is completed to inform the Student Services offices that the block can be removed. The online request must be submitted two weeks before the student intends to register for graduate level classes. The student will then be considered a fully admitted student, and may pass to the Graduate Phase of the program. Students may submit the Change of Status request by logging in to MyCTI.

## Foundations Phase

The Foundation Phase consists of 3 required courses:

CSC 421 Applied Algorithms and Structures  
SE 435 Distributed Systems I  
SE 450 Object-Oriented Software Development

Fully admitted students in the foundations phase may register for a maximum of four Advanced phase courses.

## Advanced Phase

The Advanced Phase consists of 3 parts:

**Core electives** : Two courses from each core group: Computer Science Concepts and Computer Systems (total: 4 courses)

**CS electives** : Four additional courses (two of which must be 500-level) from the below comprehensive list of courses. The courses are grouped as follows for convenience: Computer Science Concepts, Computer Systems, Database Systems, Artificial Intelligence, Bioinformatics, Computer Vision, Data Analysis, Computer Graphics, Software Engineering, Security, Network Technologies, Computer Games and Animation, User Interfaces, and Information Systems. Two of the courses must be 500-level. The Independent Study course (CSC 695) may be taken for up to 8 credits and each 4 credit-hours of CSC695 will count towards one 500-level CS elective. A student may concentrate in one area by taking all 4 courses from the same group of courses, or may wish to take courses from a variety of areas.

**CTI electives** : Two elective courses. Elective courses are any CTI courses in the range 420-699. Overall, at least four 500-level courses. A Master's Thesis or a Master's Research option is available to interested students.

**Computer Science Concepts** : these courses cover core Computer Science concepts, techniques, algorithms and structures with applications to a broad area of Computer Science.

CSC 431 Scientific Computing  
CSC 440 Cryptology  
CSC 444 Automata Theory and Formal Grammars  
CSC 447 Concepts of Programming Languages  
CSC 480 Foundations of Artificial Intelligence  
CSC 481 Introduction to Image Processing  
CSC 491 Advanced Algorithms  
CSC 503 Parallel Algorithms  
CSC 521 Monte Carlo Simulations: Algorithms and Applications  
CSC 525 Combinatorial Optimization  
CSC 531 Introduction to Bioinformatics  
CSC 535 Formal Semantics of Programming Languages  
CSC 489 Theory of Computation  
CSC 547 Advanced Topics in Program Languages  
CSC 575 Intelligent Information Retrieval  
CSC 578 Neural Networks and Machine Learning  
GPH 436 Fundamentals of Computer Graphics

**Computer Systems** : these courses cover computer systems, i.e. computer applications that provide an infrastructure used by a variety of other computer applications; most of these courses will require substantial programming.

CSC 443 Introduction to Operating Systems  
CSC 448 Compiler Design  
CSC 545 Advanced Computer Organization  
CSC 546 Operating Systems Design  
CSC 548 Advanced Compiler Design  
CSC 549 Database System Implementation  
CSC 551 Distributed Database Systems  
CSC 553 Advanced Database Concepts  
SE 473 Security Architecture I  
SE 536 Distributed Systems II  
SE 540 Software Development for Mobile and Wireless Systems  
SE 542 Software Development for Limited and Embedded Devices  
SE 552 Concurrent Software Development  
SE 573 Security Architecture II  
TDC 561 Network Programming  
TDC 577 Network Security II  
CNS 450 Computer Forensics

### **CS Elective Courses**

CS elective courses include courses in the Computer Science Concepts and the Computer Systems groups, as well as the courses listed below. The courses are grouped for convenience. A student may concentrate in one area by taking all 4 courses from the same group of courses, or may wish to take courses from a variety of areas.

### **Database Systems courses**

CSC 449 Database Technologies  
CSC 452 Database Programming  
CSC 454 Database Administration and Management  
CSC 549 Database System Implementation  
CSC 550 Object-Oriented Databases  
CSC 551 Distributed Database Systems  
CSC 553 Advanced Database Concepts  
CSC 589 Topics in Database  
CSC 575 Intelligent Information Retrieval  
CSC 543 Spatial Databases and Geographic Information Systems

### **Artificial Intelligence courses**

CSC 457 Expert Systems  
CSC 458 Symbolic Programming  
CSC 480 Foundations of Artificial Intelligence  
CSC 578 Neural Networks and Machine Learning  
CSC 587 Cognitive Science  
CSC 594 Topics in Artificial Intelligence  
CSC 575 Intelligent Information Retrieval

### **Bioinformatics courses**

CSC 531 Introduction to Bioinformatics  
CSC 541 Introduction to Proteomics  
CSC 542 Research Practicum in Computational Biology

### **Computer Vision courses**

CSC 481 Introduction to Image Processing  
CSC 484 Introduction to Computer Vision  
CSC 498 Digital Signal Processing  
CSC 538 Vision Systems

CSC 482 Applied Image Analysis  
CSC 584 Computer Vision  
CSC 592 Topics in Computer Vision and Pattern Recognition

#### **Data Analysis courses**

CSC 423 Data Analysis and Regression  
CSC 424 Advanced Data Analysis  
CSC 425 Time Series Analysis and Forecasting  
CSC 428 Data Analysis for Experimenters  
CSC 521 Monte Carlo Simulations: Algorithms and Applications  
CSC 578 Neural Networks and Machine Learning  
CSC 598 Topics in Data Analysis  
ECT 584 Web Data Mining for Business Intelligence  
SE 468 Software Measurement/Project Estimation  
SE 567 Software Reliability  
IS 567 Knowledge Discovery Technologies

#### **Computer Graphics courses**

GPH 425 Survey of Computer Graphics  
GPH 436 Fundamentals of Computer Graphics  
GPH 438 Computer Animation Survey  
GPH 448 Computer Graphics Scripting  
GPH 450 Digital Modeling I  
GPH 469 Computer Graphics Development  
GPH 470 Survey of Computer Graphics  
GPH 536 Smooth Surface Modeling for Graphics and Animation  
GPH 538 Rigging for Animation  
GPH 539 Advanced Rendering Techniques  
GPH 540 Procedural Shading  
GPH 541 Advanced Lighting Techniques  
GPH 560 Modeling Spaces  
GPH 570 Visualization  
GPH 572 Principles of Computer Animation  
GPH 575 Advanced Graphics Development  
GPH 595 Topics in Graphics

#### **Software Engineering courses**

CSC 438 Framework for Web Application Development  
SE 425 Principles and Practices of Software Engineering  
SE 427 Software Quality Management  
SE 430 Object Oriented Modeling  
SE 431 Model-Driven Software Development  
SE 433 Software Testing  
SE 452 Object-Oriented Enterprise Computing  
SE 468 Software Measurement/Project Estimation  
SE 469 Software Safety  
SE 470 Software Development Processes  
SE 472 Personal Software Process  
SE 473 Security Architecture I  
SE 477 Software and Systems Project Management  
SE 480 Software Architecture  
SE 482 Requirements Engineering  
SE 529 Software Risk Management  
SE 531 Formal Software Specifications and Development II  
SE 533 Software Validation and Verification  
SE 536 Distributed Systems II  
SE 542 Software Development for Limited and Embedded Devices  
SE 546 Software Architecture and Design for Desktop Applications  
SE 552 Concurrent Software Development  
SE 554 Enterprise Component Architecture

SE 558 Architecture and Design for Multiplayer Games  
SE 560 Structured Document Interchange and Processing  
SE 567 Software Reliability  
SE 571 Software Maintenance  
SE 573 Security Architecture II

### **Security courses**

CNS 450 Computer Forensics  
CNS 477 Legal Issues in Information Assurance  
CNS 594 Computer Information and Network Security Capstone  
CSC 440 Cryptology  
SE 536 Distributed Systems II  
ECT 582 Secure Electronic Commerce  
IS 511 Social Issues of Computing  
IS 433 Information Security Management  
SE 473 Security Architecture I  
SE 482 Requirements Engineering  
SE 529 Software Risk Management  
SE 573 Security Architecture II  
TDC 477 Network Security  
TDC 511 Telecommunications Practicum  
TDC 562 Computer-Communication Network Design and Analysis  
TDC 563 Protocols and Techniques for Data Networks  
TDC 577 Network Security II  
TDC 588 Advanced Network Defense Systems

### **Network Technologies courses**

TDC 432 Computer and Information Systems Modeling  
TDC 460 Foundations of Communications Systems  
TDC 463 Computer Networks and Data Systems  
TDC 464 Voice Communication Networks  
TDC 477 Network Security  
TDC 511 Telecommunications Practicum  
TDC 512 Cellular and Wireless Telecommunications  
TDC 514 Computer Telephony  
TDC 561 Network Programming  
TDC 562 Computer-Communication Network Design and Analysis  
TDC 563 Protocols and Techniques for Data Networks  
TDC 564 Local Area Networks  
TDC 565 Voice and Data Integration  
TDC 566 Broadband Access Technologies  
TDC 567 Telecommunication Systems Design and Management  
TDC 568 Network Management  
TDC 573 Multimedia Networking  
TDC 577 Network Security II  
TDC 588 Advanced Network Defense Systems

### **Information Systems courses**

CNS 477 Legal Issues in Information Assurance  
IS 433 Information Security Management  
IS 511 Social Issues of Computing  
IS 567 Knowledge Discovery Technologies

### **Computer Game Development courses**

GAM 476 Artificial Intelligence for Computer Games  
SE 456 Architecture of Computer Games  
SE 556 Advanced Architecture of Computer Games  
SE 558 Architecture and Design for Multiplayer Games

### **User Interfaces Courses**



HCI 440 Usability Engineering  
HCI 454 Interaction Design  
HCI 460 Usability Evaluation Methods  
SE 456 Architecture of Computer Games  
ECT 455 E-Commerce Web Site Engineering

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer Science □ Master's Independent Study

## **Master's Independent Study**

Students interested in a more in-depth study of a particular area can choose to work with a faculty member (not necessarily their academic advisor) on an independent study or research project. The work involved may include system development, empirical studies, or theoretical work. The student will register for up to 4 credit hours of CSC 695 (Master's Independent Study). 4 credit hours of CSC695 replace one 500 level CS elective course in the MS in CS program. CSC695 can be taken multiple times for up to 8 credit hours. Students must successfully complete the Core Knowledge courses prior to their first enrollment in CSC 695. Students interested in the Master's Research option must take CSC 695 for 8 credits. Students interested in the Master's Thesis option will typically take 8 credits of CSC695.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer Science □ Masters Research

## **Masters Research**

A student who has made a significant contribution to a research project, through work done in 2 quarters of CSC 695 (8 credit-hours), may choose to complete the Master's Research option. The student must submit a technical report detailing the results of the research project. This report must be approved by the student's research supervisor and the faculty advisor, at which point it will be made available to the public as a CTI Departmental Master's Research Technical Report. In that case, the student will be allowed to register for the 0 credit course CSC 696 (Master's Research) and the transcript will show the research project title as the course topic.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer Science □ Master's Thesis

## **Master's Thesis**

A student who has made an original contribution to the area (through work done by CSC 695, typically) may choose to complete a Master's Thesis. The student and the student's research advisor should form a Master's Thesis Committee of 3 faculty. The student will need submit to the committee a thesis detailing the results of the research project. After a public defense, the committee will decide whether to accept the thesis. In that case, the student will be allowed to register for the 0 credit course CSC698 (Master's Thesis) and the transcript will show the thesis title as the course topic. The thesis will be made available to the public as a CTI Departmental Master's Thesis Technical Report.

# Juris Doctorate and Master of Arts

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Juris Doctorate and Master of Arts

## About

The general objective of the joint JD/MA degree program at DePaul University College of Law Center for Intellectual Property Law & Information Technology (CIPLITŽ) and its School of Computer Science, Telecommunications and Information Systems (CTI) is to offer law students the opportunity to acquire technology knowledge that will support them in their work in information technology law, intellectual property law, or patent law. This joint degree accommodates JD students without a technical or scientific background who are interested in intellectual property by offering a depth of knowledge and ability to communicate in technical terms. These tools are invaluable, as future intellectual property lawyers will require at a minimum a general understanding of computer and information systems, given the prominence of cyber- and telecommunications issues in today's legal practice. The JD/MA also accommodates JD students with technical or scientific backgrounds who may be interested in a broad-based exposure to computer or information systems. Where the JD/MS degree offers students an in-depth approach to specific computer science or information systems topics, the JD/MA presents a broader view that will prepare graduates of the joint degree program to interact successfully with clients and experts in computer-related fields.

## Characteristics of the program include:

- This joint degree is designed to provide intensive technological training to students with non-technical backgrounds who wish to pursue legal careers focused on high technology.
- Some students may wish to use the JD/MA program as a means to fulfill the technical education requirements for the patent bar exam. Such students will need to consult closely with faculty advisors in both Schools and to contact the USPTO for specific eligibility requirements.
- It is expected that most students who pursue this joint degree will also obtain a Certificate in Intellectual Property: General, Intellectual Property: Patent or Information Technology from the law school.
- This program simultaneously offers a variety of curriculum options encompassing key technological topics along with legal courses which prepare the student for transactional and/or litigation work.

## In this program, students will acquire:

- An in-depth understanding of the legal issues that confront present and future technologies.
- An understanding of legal principles and application of those principles to a growing number of legal issues facing technology
- A broad exposure to current IT theory and practices including telecommunication and data communication fundamentals, database, computer and network security, B2C e-commerce technologies, object-oriented concepts, and client server architecture.

## Course Requirement Reductions in the Joint Degree Program:

- Joint degree students may substitute up to 8 law semester hours in place of up to 3 CTI masters degree courses, reducing their CTI course requirements to 10 courses plus any necessary prerequisite coursework. Courses to be substituted must be selected from the elective and required courses for the College of Law certificates in Intellectual Property: General, Intellectual Property: Patent and Information Technology. Please see the certificate pages on the College of Law website for lists of qualifying courses.
- Joint degree students may substitute up to 15 CTI credit hours in place of up to 10 of the 86 required law semester hours, reducing their law course requirements to 76 semester hours. Only CTI courses taken after enrollment in the College of Law may be substituted for law courses.
- Joint degree students may not substitute CTI credit hours for required courses in the College of Law,

- such as the Professional Responsibility and Senior Seminar courses.
- Joint degree students must graduate from both schools on the same date, in the same semester/quarter, and in the same year. Double counting of credit hours occurs only after the student concurrently completes both degree programs. Students should consult with the joint degree advisors regarding any questions about coordinating the completion of the two degrees.

Admission Procedures and Requirements

Sample Law School/CTI four-year course plan

School of Computer Science, Telecommunications & Information Systems - Graduate Studies ▫ Doctorates and Masters ▫ Juris Doctorate and Master of Arts ▫ Admission Procedures and Requirements

## **Admission Procedures and Requirements**

Admission to this joint program requires: (1) completion with a 3.0 grade point average or better of the first-year required courses in the JD program at the DePaul University College of Law (part-time students must have completed three semesters) and (2) acceptance to CTI. Students should indicate their interest in the joint degree program when applying to CTI.

Application to the joint degree program should be made to Assistant Dean Diana White at the College of Law after the above requirements have been met. Applicants should submit a letter indicating their intent to apply for the joint degree program along with a copy of their first year (or first three semesters for part-time students) law grades demonstrating compliance with the 3.0 grade point average requirement. Students are encouraged to make an appointment with Dean White to discuss their joint degree applications and plans for pursuing the joint degree.

Application to CTI may be made at any time, but law students will ordinarily find it most advantageous to apply to CTI after receiving first-year law grades (ordinarily in early July following the first year.) Students accepted into the joint JD/MA Program must meet the CTI prerequisite phase course requirements for the MA degree, either through their undergraduate coursework or by adding a prerequisite phase to their joint degree program. Students who need to take prerequisite courses during their pursuit of the joint degree may require more than four years from admission to Law School to complete the Joint Degree. It is highly recommended that law students interested in the joint degree program contact Prof. Danny Mittleman or Prof. Curt White at CTI to discuss their individual circumstances before applying to CTI.

Transfer students or students who have enrolled in CTI before applying to the College of Law should consult with the joint degree program advisors to determine how their special circumstances may affect their qualifications for the joint degree.

Further information about admission requirements and procedures may be found in the general description of Admission Requirements for Joint Degrees found on the College of Law website under Academic Programs.

### **Financial Considerations:**

- Joint degree students will pay on a per-credit-hour basis in both the College of Law and CTI
- Because the joint degree program permits double-counting of coursework, the total cost for the two degrees will be significantly lower under the joint degree program
- Admission to the joint degree program will ordinarily not affect College of Law scholarship awards. However, students should consult with Dean White about their specific scholarships
- Financial aid recipients must consult with Clare Timm at the financial aid office to obtain a revised (often increased) financial aid award based on their participation in the joint degree program

## Sample Law School/CTI four-year course plan

The student must complete the regular first year JD program before being admitted to the Joint Degree. The second and third years might consist of three law courses in Fall Semester and two law courses in Spring Semester as well as one CTI course Fall Quarter, two CTI courses Winter Quarter, and two CTI courses Spring Quarter. The fourth year might consist of three law courses Fall Semester, one CTI course Fall Quarter, three CTI courses Winter Quarter, and three CTI courses Spring Quarter. This schedule allows for completion of the JD as well as completion of 14 CTI courses (the MS program plus four prerequisite courses). It is possible that, because of prerequisite coursework, the program may take some students more than four years.

Since each student will require a different number of CTI prerequisites and each student will select courses based on semester/quarter availability, any particular curriculum might be different from the sample curriculum shown. All joint degree students will be encouraged to select courses with the assistance of Joint Degree program advisors at both the Law School and CTI.

### **Prerequisite Phase**

The Prerequisite Phase is intended to insure that all students enter CTI coursework with adequate preparation for successful work. Students may receive waivers for the Prerequisite Phase based on prior experience, previous coursework, or performance on a Graduate Assessment Examination (GAE). The following coursework constitutes the Prerequisite Phase:

CSC 211 Programming in Java I  
CSC 212 Programming in Java II  
IT 263 Applied Networks and Security

### **Graduate Phase**

The following coursework is required in the Graduate Phase:

ECT 425 Technical Fundamentals of Distributed Information Systems  
CSC 449 Database Technologies  
ECT 433 Survey of Web Programming Technologies  
ECT 455 E-Commerce Web Site Engineering  
IS 425 Enterprise Information  
IS 511 Social Issues of Computing  
TDC 572 Network Security  
or ECT 582 Secure Electronic Commerce

Two CTI elective courses [numbered 420-599] for which the student has completed adequate prerequisites.

### **Culminating Thesis**

The Culminating Thesis is an independent research article that demonstrates a student's ability to integrate both technical expertise and legal knowledge. Normally, it is undertaken during the student's final year in the Joint Degree program.

In this work, the student is guided and assessed by a Committee of three faculty, at least one of whom is fulltime at CTI and at least one of whom is fulltime at the College of Law. It is the responsibility of the student to find an advisor (Committee Chair) and assemble this committee.

The Masters Thesis will use the course number IT 698. It may be taken for two or four credits per quarter. Students may register for this course only after their advisor has approved a written proposal for their thesis. Students must continue to register for this course every quarter after their first registration in it until they complete their thesis to the satisfaction of their committee. They earn two hours of credit for each such registration but only four hours of credit will apply for degree credit.

### **Electives**

12 additional quarter hours fulfilled by courses from the IP Certificate courses. These courses will also be counted toward the JD degree.

### **Joint Degree Program Advising and For Further Information**

Students are encouraged to consult with the following advisors regarding their participation in the joint degree program:

- Assistant Dean Diana White - College of Law - dwhite@depaul.edu - For questions regarding administrative aspects of the joint degree and College of Law programs
- Professor Katherine Strandburg - College of Law - kstrandb@depaul.edu - For questions regarding substantive aspects of the College of Law IP and IT programs
- Professor Danny Mittleman CTI - danny@cs.depaul.edu - For questions regarding substantive aspects of the CTI program
- Professor Curt White CTI - cwhite@cs.depaul.edu - For questions regarding substantive aspects of the CTI program

# Juris Doctorate and Master of Science

School of Computer Science, Telecommunications & Information Systems - Graduate Studies ▫ Doctorates and Masters ▫ Juris Doctorate and Master of Science

## About

The primary goal of the joint degree JD/MS program at DePaul University College of Law Center for Intellectual Property Law & Information Technology (CIPLITŽ) and its School of Computer Science, Telecommunications and Information Systems (CTI) is to educate students to take advantage of the opportunities presented by the legal needs of industry in this high technology age. A critical need exists for patent attorneys in the high-tech field who have a substantive understanding of IT as well as for attorneys, who need not be members of the patent bar, to provide client counseling or litigation services in the information technology field. Graduates of the joint degree program will be qualified for careers in intellectual property boutique law firms, in general practice firms with clients in the high technology field, as in-house counsel in the high technology industry, and in government agencies dealing with high technology regulation.

Many of the students completing the joint JD/MS degree will choose to join the Patent Bar. The technical education provided by the MS part of the program will help to qualify them for the patent bar exam. However, in today's society, members of the Patent Bar are not the only attorneys who need technological expertise for successful legal practice. Many patent litigators are not members of the patent bar, yet must become intimately familiar with the technological bases for their clients litigation positions. Trademark attorneys face infringement and prosecution issues related to domain names and Internet websites. Copyright attorneys are frequently exposed to issues of protection for computer software and Internet website content. Even lawyers who do not specialize in intellectual property law frequently face computer-related issues, as such questions arise more and more frequently in "bread-and-butter" disputes between companies immersed in high technology.

The JD/MS program is primarily aimed at students with undergraduate scientific or technical degrees or with other substantial technological or scientific background who wish to deepen their technical expertise while also obtaining a law degree.

### Characteristics of the program include:

- 

It is designed to provide a curriculum for students with significant undergraduate technological background who wish to pursue advanced studies in Computer Science, Telecommunications, and Information Systems jointly with their legal studies.

- It offers a variety of curriculum options encompassing key technological topics along with legal courses which prepare the student for transactional and/or litigation work.
- It is expected that most students who pursue this joint degree will also obtain a Certificate in Intellectual Property: General, Intellectual Property: Patent or Information Technology from the law school.
- It is expected that most students who pursue the JD/MS degree will already be qualified to sit for the patent bar exam. Students who need to "make up" some patent bar exam requirements may be able to pursue that goal as part of this program

### In this program, students will acquire:

- An in-depth understanding of the legal issues that confront present and future technologies.
- An understanding of legal principles and application of those principles to a growing number of legal issues facing technology
- Core knowledge in a particular technology discipline
- In-depth fluency with state-of-the-art technologies and IT principles.

### Course Requirement Reductions in the Joint Degree Program:

- Joint degree students may substitute up to 8 law semester hours in place of up to 3 CTI masters degree courses, reducing their CTI course requirements to 10 courses plus any necessary prerequisite coursework. Courses to be substituted must be selected from the elective and required courses for the College of Law certificates in Intellectual Property: General, Intellectual Property: Patent and Information Technology. Please see the certificate pages on the College of Law website for lists of qualifying courses.
- Joint degree students may substitute up to 15 CTI credit hours in place of up to 10 of the 86 required law semester hours, reducing their law course requirements to 76 semester hours. Only CTI courses taken

after enrollment in the College of Law may be substituted for law courses.

- Joint degree students may not substitute CTI credit hours for required courses in the College of Law, such as the Professional Responsibility and Senior Seminar courses
- Joint degree students must graduate from both schools on the same date, in the same semester/quarter, and in the same year. Double counting of credit hours occurs only after the student concurrently completes both degree programs. Students should consult with the joint degree advisors regarding any questions about coordinating the completion of the two degrees.

Administration Procedures and Requirements

Sample Law School/CTI four-year course plan

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Juris Doctorate and Master of Science □ Administration Procedures and Requirements

## **Administration Procedures and Requirements**

Admission to this joint program requires: (1) completion with a 3.0 grade point average or better of the first-year required courses in the JD program at the DePaul University College of Law (part-time students must have completed three semesters) and (2) acceptance to CTI. Students should indicate their interest in the joint degree program when applying to CTI.

Application to the joint degree program should be made to Assistant Dean Diana White at the College of Law after the above requirements have been met. Applicants should submit a letter indicating their intent to apply for the joint degree program along with a copy of their first year (or first three semesters for part-time students) law grades demonstrating compliance with the 3.0 grade point average requirement. Students are encouraged to make an appointment with Dean White to discuss their joint degree applications and plans for pursuing the joint degree.

Application to CTI may be made at any time, but law students will ordinarily find it most advantageous to apply to CTI after receiving first-year law grades (ordinarily in early July following the first year.) Students must declare a specific MS degree upon application to CTI and meet the CTI prerequisite phase course requirements for that degree, either through their undergraduate coursework or by adding a prerequisite phase to their joint degree program. Students who need to take prerequisite courses during their pursuit of the joint degree may require more than four years from admission to law school for completion of the joint degree. It is highly recommended that law students interested in the joint degree program contact Prof. Danny Mittleman or Prof. Curt White at CTI to discuss their individual circumstances before applying to CTI.

Transfer students or students who have enrolled in CTI before applying to the College of Law should consult with the joint degree program advisors to determine how their special circumstances may affect their qualifications for the joint degree.

Further information about admission requirements and procedures may be found in the general description of Admission Requirements for Joint Degrees found on the College of Law website under Academic Programs.

### **Financial Considerations:**

- Joint degree students will pay on a per-credit-hour basis in both the College of Law and CTI
- Because the joint degree program permits double-counting of coursework, the total cost for the two degrees will be significantly lower under the joint degree program
- Admission to the joint degree program will ordinarily not affect College of Law scholarship awards. However, students should consult with Dean White about their specific scholarships
- Financial aid recipients must consult with Clare Timm at the financial aid office to obtain a revised (often increased) financial aid award based on their participation in the joint degree program

## Sample Law School/CTI four-year course plan

The student must complete the regular first year JD program before being admitted to the Joint Degree. The second and third years might consist of three law courses in Fall Semester and two law courses in Spring Semester as well as one CTI course Fall Quarter, two CTI courses Winter Quarter, and two CTI courses Spring Quarter. The fourth year might consist of three law courses Fall Semester, one CTI course Fall Quarter, three CTI courses Winter Quarter, and three CTI courses Spring Quarter. This schedule allows for completion of the JD as well as completion of 14 CTI courses (the MS program plus four prerequisite courses). It is possible that, because of prerequisite coursework, the program may take some students more than four years.

Since each student will require a different number of CTI prerequisites and each student will select courses based on semester/quarter availability, any particular curriculum might be different from the sample curriculum shown. All joint degree students will be encouraged to select courses with the assistance of Joint Degree program advisors at both the Law School and CTI.

### CTI Requirements for an MS Degree

For the CTI portion of the joint degree, students may major in:

- Computer Information and Network Security
- Computer Science
- Distributed Systems
- E-Commerce Technology
- Information Systems
- Telecommunications

Each program listed above follows the requirements as listed on its page on the CTI website. These requirements are divided into the phases. Upon completion of those requirements, each student will move to the Elective Phase as described below.

### Electives

12 additional quarter hours fulfilled by courses from the IP Certificate courses. These courses will also be counted toward the JD degree.

### Joint Degree Program Advising and For Further Information

Students are encouraged to consult with the following advisors regarding their participation in the joint degree program:

- Assistant Dean Diana White - College of Law - [dwhite@depaul.edu](mailto:dwhite@depaul.edu) - For questions regarding administrative aspects of the joint degree and College of Law programs
- Professor Katherine Strandburg - College of Law - [kstrandb@depaul.edu](mailto:kstrandb@depaul.edu) - For questions regarding substantive aspects of the College of Law IP and IT programs
- Professor Danny Mittleman CTI - [danny@cs.depaul.edu](mailto:danny@cs.depaul.edu) - For questions regarding substantive aspects of the CTI program
- Professor Curt White CTI - [cwhite@cs.depaul.edu](mailto:cwhite@cs.depaul.edu) - For questions regarding substantive aspects of the CTI program

## Master of Science in Computer, Information and Network Security

### About

The **Master of Science in Computer, Information and Network Security** offers students the opportunity to specialize in the fast-growing Information Assurance and Security field. Students will be able to earn an advanced degree from a university designated as a National Center of Academic Excellence in IA Education by the Department of Homeland Security (DHS) and National Security Agency (NSA).

The MS in Computer, Information and Network Security program is intended for students who wish to specialize in the security aspects of the Information Technology field. Students who complete the program will be prepared to:

- Assess the information security risks faced by an organization
- Understand technology and human factors related to these risks
- Evaluate tools and resources currently available to limit risk, mitigate the effects of hostile action and recover from attack
- Manage the development, implementation and evolution of a security infrastructure
- Assess the impact of policy, legislation, compliance requirements and market trends on organizational security objectives
- Design, implement and maintain software systems designed to support security policy and goals
- Develop and maintain a network architecture consistent with mitigating risk and preventing hostile attack
- Be lifelong learners in the information security environment

### **Concentrations**

The **Computer Security** concentration focuses on fundamental security topics that arise in the design, analysis, and implementation of distributed systems. This concentration provides in-depth coverage of the theory and application of identity, authentication, access control, auditing, assessment & prevention of software vulnerabilities, and cryptography, in the context of modern enterprise-scale & web-based systems.

The **Information Systems** concentration focuses on the organizational and management aspects of information security. Students will learn how to plan and implement security plans, to include risk assessment, threat and vulnerability analysis, implementation of controls and safeguards, and maintenance. Students will also learn about related areas such as regulatory compliance, legal issues in security, and disaster recovery.

The **Network Security** concentration focuses on the network infrastructure and network security management aspects information security. This concentration will provide in-depth coverage of network security infrastructure technologies such as firewalls, Virtual Private Networks (VPN), Intrusion Detection and Prevention Systems (IDS/IPS), vulnerability assessment tools, as well as overall security infrastructure engineering and design.

The **Regulation, Compliance, & Audit** Concentration focuses on the impact of Information Assurance legislation and IT security controls requirements on Enterprises. This concentration expands the information assurance aspects to IT and financial auditing and provide a sound foundations for students looking for a career in auditing, compliance and information security management.

### **What Students Will Learn From The Program**

- Information assurance fundamentals
- Organizational security framework
- Ability to analyze vulnerabilities and threats to an enterprise security infrastructure and how to develop and deploy control mechanisms to protect the enterprise
- How to determine, design, implement and support a security infrastructure throughout its life-cycle
- The impact of security requirements on business operations

### **Program Information**

The program follows a three-phase sequence, with each phase preparing the students for the subsequent phase. The master's degree program consists of

- Prerequisite Phase
- Foundation Phase
- Advanced Phase

Upon acceptance into the masters degree program, the student will meet with their faculty advisor to discuss required courses for the Prerequisite Phase. The Prerequisite Phase is intended to ensure that all students enter graduate courses with an equivalent background. While completing this phase, a student is considered a



conditionally admitted masters student. In the Core Knowledge phase, a student will follow a sequence of courses to acquire an understanding of the technological and theoretical foundations for the particular degree. In the Advanced Phase of the program, the fundamental information learned previously allows a student to study advanced topics within their chosen degree. This phase adds depth to the work completed in the Core Knowledge Phase. Individual interests and needs are also addressed through a series of elective courses chosen in consultation with the students faculty advisor.

Grade and GPA requirements

Prerequisite Phase

Foundation Phase

Advanced Phase

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer, Information and Network Security □ Grade and GPA requirements

## Grade and GPA requirements

**Grades:** Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.

**GPA:** Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.90 or higher will graduate with distinction.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer, Information and Network Security □ Prerequisite Phase

## Prerequisite Phase

The following courses are required for the **Computer Security** concentration:

CSC 211 Programming in Java I [Self Placement Test Available!](#)

CSC 212 Programming in Java II

or CSC 224 Java for Programmers

or CSC 396 Programming in Java I and II

CSC 373 Computer Systems I

CSC 374 Computer Systems II

CSC 383 Data Structures and Algorithms in Java

The following courses are required for the **Information Systems Security** concentration:

CSC 211 Programming in Java I [Self Placement Test Available!](#)

CSC 212 Programming in Java II

or CSC 224 Java for Programmers

or CSC 396 Programming in Java I and II

IT 215 Analysis and Design Techniques [Self Placement Test Available!](#)

ECT 310 Internet Application Development

The following courses are required for the **Network Security** concentration:

CSC 211 Programming in Java I [Self Placement Test Available !](#)

or CSC 261 Programming Languages I: C/C++

or any more advanced programming course  
IT 223 Data Analysis [Self Placement Test Available!](#)  
TDC 311 Computers in Telecommunications Systems  
or CSC 373 Computer Systems I  
TDC 361 Basic Communication Systems

The following courses are required for the **Regulation, Compliance & Audit** concentration:

TDC 361 Basic Communication Systems  
or IT 263 Applied Networks and Security

By taking these courses and receiving a grade of a B- or better in each, the student will have completed the requirements of the Prerequisite Phase.

All or part of the Prerequisite Phase may be waived if a student has the equivalent academic background. Alternatively, students with practical experience may complete a Graduate Assessment Examination (GAE) to show competency in a prerequisite. All students are blocked from enrolling in Foundation Phase courses prior to completing their prerequisites. The student must submit an online Change of Status request when the Prerequisite Phase is completed to inform the Student Services offices that the block can be removed. The online request must be submitted two weeks before the student intends to register for graduate level classes. The student will then be considered a fully admitted student, and may pass to the Graduate phase of the program. Students may submit the Change of Status request by logging in to MyCTI.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer, Information and Network Security □ Foundation Phase

## Foundation Phase

The following two (2) courses are required for the **Computer Security** Concentration:

SE 435 Distributed Systems I  
SE 450 Object-Oriented Software Development

The following two (2) courses are required for the **Information Systems Security** Concentration:

IS 425 Enterprise Information  
TDC 463 Computer Networks and Data Systems

The following two (2) courses are required for the **Network Security** Concentration:

TDC 460 Foundations of Communications Systems  
TDC 463 Computer Networks and Data Systems

The following two (2) courses are required for the **Regulation, Compliance & Audit** Concentration:

ACC 500 Financial Accounting  
TDC 463 Computer Networks and Data Systems

The following three (3) courses are required for **all** concentrations:

TDC 477 Network Security  
IS 511 Social Issues of Computing  
or CNS 477 Legal Issues in Information Assurance  
**Note** : RCA student **MUST** take CNS 477 instead of IS 511  
IS 433 Information Security Management

### Foundation Phase GPA Requirements:

To progress to the Advanced Phase of the degree, a student must complete the Prerequisite Phase and Foundation Phases.

## **GPA Requirement:**

A student must achieve an average grade of 3.0 or better in the five (5) courses that form the Foundation Phase.

A student who does not meet the grade requirement must retake the course with the lowest grade. If a number of such courses exist, then it is up to the student to choose which class to retake. Only the higher grade will count toward the average grade for the purpose of completing the GPA Requirement.

Students that do not meet the GPA requirements, and do not want to re-take a class are encouraged to see faculty advising guidance to discuss their options.

A maximum of four (4) courses in the Advanced Phase can be taken before a student completes the Foundation Phase and fulfill the GPA Requirement.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Computer, Information and Network Security □ Advanced Phase

## **Advanced Phase**

The MS-CINS advanced phase is composed of four (4) parts:

- CINS Concentration Area
  - CINS Elective
  - CTI Open Electives
  - Capstone or Thesis Requirement
- 

## **CINS Concentration Area**

According to their concentration a student must meet the following requirements:

### **Computer Security Concentration:**

A student must complete the following 2 courses:

CSC 440 Cryptology  
SE 473 Security Architecture I

A student must complete one (1) of the following two (2) courses:

SE 547 Foundations of Computer Security  
SE 573 Security Architecture II

A student must complete one (1) of the following six (6) courses:

SE 536 Distributed Systems II  
SE 482 Requirements Engineering  
SE 547 Foundations of Computer Security  
SE 573 Security Architecture II  
SE 529 Software Risk Management  
TDC 577 Network Security II  
or TDC 588 Advanced Network Defense Systems

### **Information Systems Security Concentration:**

A student must complete the following course:

IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance

A student must complete three (3) of the following eleven (11) courses:

SE 430 Object Oriented Modeling

IS 511 Social Issues of Computing (This course can not be counted in this category if used for foundation phase fulfillment)

CNS 477 Legal Issues in Information Assurance (This course can not be counted in this category if used for foundation phase fulfillment)

IS 483 Information Services and Operations

IS 540 Global Information Technology

ECT 582 Secure Electronic Commerce

ECT 585 Legal Aspects of E-Commerce

IS 505 Business Continuity and Disaster Recovery

SE 529 Software Risk Management

SE 482 Requirements Engineering

TDC 577 Network Security II

or TDC 588 Advanced Network Defense Systems

**Network Security Concentration:**

A student must complete the following 3 courses:

TDC 511 Telecommunications Practicum

TDC 563 Protocols and Techniques for Data Networks

TDC 577 Network Security II

or TDC 588 Advanced Network Defense Systems

A student must complete one (1) of the following four (4) courses:

TDC 561 Network Programming

TDC 562 Computer-Communication Network Design and Analysis

TDC 567 Telecommunication Systems Design and Management

ECT 582 Secure Electronic Commerce

**Regulation, Compliance & Audit Concentration:**

A student must complete the following 3 courses:

ACC 541 Financial Accounting Theory and Practice I

ACC 547 Audit and Regulation of Corporate Financial Reporting

IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance

A student must complete one (1) of the following eight (8) courses:

ACC 550 Advanced Topics in Auditing

ACC 543 Financial Accounting Theory and Practice II

ACC 552 Legal and Ethical Environment of Accounting Practice

ECT 582 Secure Electronic Commerce

IS 425 Enterprise Information

IS 505 Business Continuity and Disaster Recovery

IS 511 Social Issues of Computing

TDC 577 Network Security II

or TDC 588 Advanced Network Defense Systems

**CINS Elective**

Student must complete 1 course from any CINS concentration area. It can be from their concentration area or any others. That course can not be used to fulfill a students CINS Concentration Area or Foundation Phase requirements.

**CTI Open Electives**

Student must complete two (2) CTI open electives.

Elective courses are in the range of 420-699 and must be from the School of CTI or from the following list: ACC 550, ACC 543 and ACC 552.

### **Capstone or Thesis Requirement**

The capstone class provides an opportunity for students to demonstrate and assess the skills they have developed during the rest of the degree.

Students should either take one of:

CNS 594 Computer Information and Network Security Capstone

or CSC 698 Master's Thesis

or ECT 698 Master's Thesis

or IS 698 Master's Thesis

or SE 698 Master's Thesis

or TDC 698 Master's Thesis

## Master of Science in Digital Cinema

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Digital Cinema

### **About**

The **Master of Science in Digital Cinema** degree emphasizes the technical and technology-based topics and practices of digital cinema. Such topics and practices include post-production editing of video and audio, the integration of video and audio, special effects and computer-generated imaging, and modes of digital distribution.

### **Concentrations**

The Master of Science (MS) degree in Digital Cinema offers two programs of graduate study for students.

The **Cinema Program** is the advanced study of all aspects of digital filmmaking including screenwriting, producing, directing, cinematography, editing, and sound design. The emphasis of the program is on the individual student's development as a digital filmmaker and storyteller.

The **Animation Concentration** features a program of study in traditional animation (hand-drawn and stop-motion), 3D modeling and character animation for cinema and game art, in addition to the core cinema courses.

Find out more at the Digital Cinema Website: <http://www.cti.depaul.edu/digitalcinema>

### **What Students Learn From The Program**

- post-production editing of video and audio
- the integratio of video and audio
- special effects
- computer-generated imaging

### **Program Information**

Prerequisite Phase

Core Knowledge Phase

## Advanced Phase

### Option for the MFA Phase

Upon acceptance into the masters degree program, the student will meet with their faculty advisor to discuss required courses for the Prerequisite Phase. The Prerequisite Phase is intended to ensure that all students enter graduate courses with an equivalent background. While completing this phase, a student is considered a conditionally admitted masters student. In the Core Knowledge phase, a student will follow a sequence of courses to acquire an understanding of the technological and theoretical foundations for the particular degree. In the Advanced Phase of the program, the fundamental information learned previously allows a student to study advanced topics within their chosen degree. This phase adds depth to the work completed in the Core Knowledge Phase. Individual interests and needs are also addressed through a series of elective courses chosen in consultation with the student's faculty advisor.

## The Cinema Program

### Grades and GPA Requirements

### Animation Concentration

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Digital Cinema □ Grades and GPA Requirements

## Grades and GPA Requirements

**Grades:** Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.

**GPA:** Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.90 or higher will graduate with distinction .

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Digital Cinema □ The Cinema Program

## The Cinema Program

### Prerequisite Phase

Students must demonstrate prerequisite competencies by transcript or by successful completion of the following courses:

DC 201 Introduction to Screenwriting  
DC 210 Digital Cinema Production I  
DC 220 Editing I

And a choice of two from the following list:

DC 215 Digital Sound Design  
DC 275 Cinematography and Lighting  
ANI 230 3d Modeling for Animation and Gaming  
ANI 231 3d Animation for Cinema and Gaming  
GAM 244 Game Development I

## GAM 245 Game Development II

By taking these courses and receiving a grade of a B- or better in each, the student will have completed the requirements of the Prerequisite Phase. All or part of the Prerequisite Phase may be waived if a student has the equivalent academic background. Alternatively, students with practical experience may complete a Graduate Assessment Examination (GAE) to show competency in a prerequisite. All students are blocked from enrolling in Core Knowledge Phase courses prior to completing their prerequisites. The student must submit an online Change of Status request when the Prerequisite Phase is completed to inform the Student Services offices that the block can be removed. The online request must be submitted two weeks before the student intends to register for graduate level classes. The student will then be considered a fully admitted student, and may pass to the Graduate Phase of the program. Students may submit the Change of Status request by logging in to MyCTI .

### **Core Knowledge Phase**

The core knowledge phase is designed to provide a common foundation in digital cinema production.

#### *Core Knowledge Courses*

Fully admitted students in the Core Knowledge phase may register for a maximum of four Advanced phase courses. The Core Knowledge Phase courses for the MS in Digital Cinema are:

DC 460 Digital Cinema Proseminar  
DC 461 Production Seminar  
DC 462 Digital Cinema Workshop

### **Advanced Phase**

The advanced phase provides specialized knowledge in digital cinema topics, as well as allowing students to choose a particular emphasis for their studies.

#### *Required Advanced Phase Courses*

DC 401 Writing the Short Motion Picture  
DC 495 Directing the Short Motion Picture  
DC 476 Visuals  
DC 430 Cinematic Animation  
DC 421 Production Design

#### *Elective Advanced Phase Courses*

Students in this program will have 3 electives to be chosen from the following list:

DC 411 Music Video Production  
DC 415 Advanced Sound Design  
DC 420 Advanced Non-Linear Editing  
DC 471 Documentary Production  
DC 475 Advanced Cinematography  
DC 478 Special Effects and Compositing  
DC 489 The Big Picture: the Entertainment Industry  
DC 490 Directing  
DC 499 Internship  
DC 476 Visuals  
DC 402 Writing the Feature Film  
DC 480 Project Bluelight  
DC 481 Distribution and Exhibition  
ANI 430 3d Character Animation  
ANI 450 Motion Capture Workshop

Students in this program will also have to take 2 graduate-level electives from any CTI MS program.

## **Animation Concentration**

### **Prerequisite Phase**

ANI 101 Animation  
ANI 230 3d Modeling for Animation and Gaming  
ANI 231 3d Animation for Cinema and Gaming

And a choice of two from the following list:

DC 215 Digital Sound Design  
DC 275 Cinematography and Lighting  
DC 201 Introduction to Screenwriting  
DC 210 Digital Cinema Production I  
DC 220 Editing I  
GAM 244 Game Development I  
GAM 245 Game Development II

### **Core Knowledge Phase**

DC 460 Digital Cinema Proseminar  
DC 461 Production Seminar  
DC 462 Digital Cinema Workshop

### **Advanced Phase**

#### *Required Advanced Phase Courses*

ANI 400 Animation Production  
ANI 435 Advanced 3d Modeling for Animation and Gaming  
ANI 430 3d Character Animation  
ANI 439 3d Texturing and Lighting  
ANI 450 Motion Capture Workshop

#### *Elective Advanced Phase Courses*

Students in this program will have 3 electives to be chosen from the following list:

DC 411 Music Video Production  
DC 415 Advanced Sound Design  
DC 420 Advanced Non-Linear Editing  
DC 475 Advanced Cinematography  
DC 478 Special Effects and Compositing  
DC 489 The Big Picture: the Entertainment Industry  
DC 490 Directing  
DC 499 Internship  
DC 476 Visuals  
DC 402 Writing the Feature Film  
DC 480 Project Bluelight  
DC 481 Distribution and Exhibition  
DC 401 Writing the Short Motion Picture  
DC 495 Directing the Short Motion Picture  
DC 412 Production Design

Students in this program will also have to take 2 graduate-level electives from any CTI MS program.



# Master of Fine Arts in Digital Cinema

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Fine Arts in Digital Cinema

## About

The Master of Fine Arts in Digital Cinema is a highly selective terminal degree program in digital filmmaking. A student is not admitted into the MFA directly; rather, a student enters the Master of Science in Digital Cinema (either the **Cinema Program** or the **Animation Concentration** ) to gain the required technical foundation in cinema production and then, during pursuit of the Master of Science degree, applies for admittance into the MFA program.

The MFA typically extends the course of study by 2-3 years beyond the completion of the MS degree. This includes one year of coursework and the successful completion of the MFA thesis project, which may be live action, animation, or a combination of the two. The MFA culminates in the public presentation of the thesis project and defense of the student's thesis project to his/her MFA Committee.

The Master of Fine Arts degree is a terminal degree in digital filmmaking. As such, the student who successfully completes the Master of Fine Arts degree is awarded the MS/MFA degree similar to the MA/Ph.D in other academic disciplines.

FIND OUT MORE AT THE DIGITAL CINEMA WEBSITE: <http://www.cti.depaul.edu/digitalcinema>

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Fine Arts in Digital Cinema □ MFA Application Process

## MFA Application Process

At any time after completing the MS Core Knowledge Phase a student may apply for admission into the MFA program. The application should be made to Gary Novak, Chair of the MS/MFA Committee. The application should include:

- a statement of purpose in pursuing the MFA degree.
- samples of creative work submitted on DVD.
- a synopsis and production/finishing schedule for the proposed thesis project.

MS/MFA Committee

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Fine Arts in Digital Cinema □ MS/MFA Committee

## MS/MFA Committee

The MS/MFA committee will meet during the second week of every academic quarter to consider applications into the program. Decisions pertaining to acceptance or rejection into the MFA program will be made only at these meetings. Students applying into the MFA program should be aware of this schedule and make their application plans accordingly. Students will be advised of MS/MFA Committee application decisions by the 5th week of the academic quarter. All admission decisions of the MS/MFA Committee are final.

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### **Students MFA Committee**

After admission into the MFA program, the student will assemble his/her MFA Committee. The committee shall have a Chair and a minimum of two other members. The Chair and one committee member must be full-time Digital Cinema Faculty. After assembling an MFA Committee the student will advise the Chair of the Digital Cinema MS/MFA Committee of the composition of that committee. The student will work closely with the Chair of his/her committee in planning and completing the MFA thesis.

The MFA Thesis

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Fine Arts in Digital Cinema □ The MFA Thesis

### **The MFA Thesis**

The MFA Thesis shall be a major artistic digital project. Although there is no prescribed length for theses, the following should be used as guidelines:

- For live action projects, 30 minutes or more. The Digital Cinema faculty encourages students to produce feature length films.
- For animation projects, 10 minutes or more.

### **The Thesis Screening**

A major component MFA degree is the public screening of the MFA thesis. It is the student's responsibility to organize, schedule, promote and publicize this screening.

### **The MFA Thesis Defense**

At some point following the public screening the student will schedule a thesis defense with his/her MFA committee. At this defense the student's MFA Committee will discuss, evaluate, and critique the thesis and make a determination on the awarding of the MFA degree.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Fine Arts in Digital Cinema □ Required Courses for the MFA in Digital Cinema

### **Required Courses for the MFA in Digital Cinema**

- DC 565 Thesis Development
- DC 566 Thesis Production
- DC 567 Thesis Post-Production

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Fine Arts in Digital Cinema □ Time Limit

### **Time Limit**

# Master of Science in E-Commerce Technology

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in E-Commerce Technology

## About

The **Master of Science in E-Commerce Technology** is designed for those who want to specialize in e-business systems development and management.

The **MS in E-Commerce Technology** exposes students to a broad and changing mix of technologies, programming languages and tools. Practica, team projects, and work for real clients provide an authentic environment for learning.

The curriculum provides flexible, modularized advanced training in e-business systems as well as competencies in Internet application development, advanced Internet technologies, and wireless applications.

Students may also expand their competencies in

- IT architecture design
- Project management
- Enterprise systems integration
- Design of information security, networks, and databases.

## What Students Learn From The Program

- Computer programming and database technology
- Web engineering methodology, user-centered design, and systems development life cycle
- Web services, e-commerce servers, Web 2.0
- Project management
- Networking and middleware

## Program Information

The program follows a three-phase sequence, with each phase preparing the student for the subsequent phase. The masters degree program consists of:

- Prerequisite Phase
- Foundation Phase
- Advanced Phase
- Competency/Course Cross List

Upon acceptance into the masters degree program, the student will meet with a faculty advisor to discuss required courses for the Prerequisite Phase. The Prerequisite Phase is intended to ensure that all students enter graduate courses with an equivalent background. While completing this phase, a student is considered a conditionally admitted masters student. In the Foundation Phase, a student will follow a sequence of courses to acquire an understanding of the technological and theoretical Foundations for the particular degree. In the Advanced Phase of the program, the fundamental information learned previously allows a student to study advanced topics within the chosen degree. This phase adds depth to the work completed in the Foundation Phase. Individual interests and needs are also addressed through a series of elective courses chosen in consultation with the students faculty advisor.

Grade and GPA requirements

Prerequisite Phase

Foundation Phase

Advanced Phase

Elective Course Restrictions

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in E-Commerce Technology □ Grade and GPA requirements

## Grade and GPA requirements

**Grades:** Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.

**GPA:** Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.90 will graduate with distinction.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in E-Commerce Technology □ Prerequisite Phase

## Prerequisite Phase

The courses in the Prerequisite Phase for the Master of E-Commerce Technology are:

CSC 211 Programming in Java I [Self Placement Test Available!](#)

CSC 212 Programming in Java II

or CSC 224 Java for Programmers [Self Placement Test Available!](#)

or CSC 396 Programming in Java I and II

ECT 310 Internet Application Development

SE 325 Principles and Practices of Software Engineering [Self Placement Test Available!](#)

CSC 383 Data Structures and Algorithms in Java

\* CSC 224 is equivalent to both CSC 211 and CSC 212. Only students with experience in programming languages should take CSC 224.

By taking these courses and receiving a grade of a B- or better in each, the student will have completed the requirements of the Prerequisite Phase. All or part of the Prerequisite Phase may be waived if a student has the equivalent academic background. Alternatively, students with practical experience may complete a Graduate Assessment Examination (GAE) to show competency in a prerequisite. All students are blocked from enrolling in Foundation Phase courses prior to completing their prerequisites. The student must submit an online Change of Status request when the Prerequisite Phase is completed to inform the Student Services offices that the block can be removed. The online request must be submitted two weeks before the student intends to register for graduate level classes. The student will then be considered a fully admitted student, and may pass to the Graduate Phase of the program. Students may submit the Change of Status request by logging in to MyCTI.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in E-Commerce Technology □ Foundation Phase

## Foundation Phase

ECT 425 Technical Fundamentals of Distributed Information Systems  
ECT 455 E-Commerce Web Site Engineering  
CSC 449 Database Technologies  
SE 430 Object Oriented Modeling

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in E-Commerce Technology □ Advanced Phase

## **Advanced Phase**

Advanced Phase (9 courses; at least four 500-level courses)

*Required* (3 courses) (Note: Along with ECT 455 and ECT 589 or ECT 590, these five courses constitute the E-Business Systems module.)

ECT 480 Intranets and Portals  
ECT 481 Internet Supply Chain Management  
ECT 582 Secure Electronic Commerce

*Electives* (5 courses)

With numerous pre-defined competency modules, students can gain expertise in addition to competency in e-business systems. A student can take four courses listed in one of the competencies based on their career goals and preferences. Students can fulfill these electives by taking courses in:

- a. One pre-defined competency module or customized module, and
- b. Additional elective courses.

*Capstone* (1 course)

ECT 589 E-Commerce Technology Capstone  
or ECT 590 E-Business Technology Practicum

Advanced Electives

## **E-Commerce Technology Modules**

*IT Management Oriented* [mn]

mn1. IT Project Management I  
mn2. IT Project Management II  
mn3. IT Planning and Global Strategies  
mn4. Legal & Social Issues  
mn5. IT Regulatory Compliance

*Internet Oriented* [in]

in1. Internet Application Development  
in2. Wireless/Mobile Applications

*Design/Development Oriented* [dd]

dd1. Application Development  
dd2. Software Engineering  
dd3. e-Business Systems  
dd4. HCI Methods  
dd5. Enterprise Systems Integration

*Data Oriented* [do]

do1. Database Design I

do2. Database Design II  
do3. Data Mining & Analytics  
do4. Knowledge Management

*Infrastructure Oriented* [if]

if1. Network Design  
if2. Information Assurance & Security Design  
if3. IT Architecture Design

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IT Management Oriented [mn]

**mn1 . IT Project Management I**

IS 483 Information Services and Operations  
IS 512 Groupware and Virtual Collaboration  
IS 535 Information Technology Investment Financial Analysis  
IS 556 Enterprise Project Management  
IS 560 Enterprise Systems  
IS 570 Enterprise System Implementation.  
SE 433 Software Testing  
SE 468 Software Measurement/Project Estimation  
SE 477 Software and Systems Project Management  
ACC 500 Financial Accounting Kellstadt Graduate School of Business  
MGT 500 Managing Effective and Ethical Organizational Behavior Kellstadt Graduate School of Business

**mn2. IT Project Management II**

ECT 556Enterprise Architecture and Design  
ECT 589 E-Commerce Technology Capstone  
IS 511 Social Issues of Computing  
IS 533Enterprise Security Infrastructure Controls and Regulatory Compliance  
IS 556Enterprise Project Management  
IS 565 It Outsourcing  
IS 578 Information Technology Consulting  
SE 529 Software Risk Management  
MGT 562 Resolving Conflict in Organizations Kellstadt Graduate School of Business  
MGT 563 Negotiation Skills Kellstadt Graduate School of Business

**mn3 . IT Planning and Global Strategies**

ECT 556Enterprise Architecture and Design  
ECT 565 Mobile Enterprise  
ECT 589 E-Commerce Technology Capstone  
IS 483 Information Services and Operations  
IS 512 Groupware and Virtual Collaboration  
IS 535 Information Technology Investment Financial Analysis  
IS 540 Global Information Technology  
IS 560Enterprise Systems  
IS 577 Information Systems Capstone  
IT 599 Topics in Global Information Technology  
ACC 500 Financial Accounting Kellstadt Graduate School of Business  
MGT 501 Strategic Supply Chain Management Kellstadt Graduate School of Business

**mn4 . Legal & Social Issues**

ECT 585 Legal Aspects of E-Commerce  
IS 433 Information Security Management  
IS 482 Legal Aspects of Information Technology  
IS 511 Social Issues of Computing  
IS 565 It Outsourcing  
IS 570Enterprise System Implementation.  
IT 599 Topics in Global Information Technology  
TDC 569 Telecommunication Regulation, Policy,law and Standards

## **mn5.** IT Regulatory Compliance

CNS 477 Legal Issues in Information Assurance  
IS 433 Information Security Management  
IS 505 Business Continuity and Disaster Recovery  
IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance  
IS 535 Information Technology Investment Financial Analysis  
IS 556 Enterprise Project Management  
IS 560 Enterprise Systems

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### Internet Oriented [in]

#### **in1.** Internet Application Development

ECT 455 E-Commerce Web Site Engineering  
ECT 556 Enterprise Architecture and Design  
ECT 557 Peer-To-peer Technology  
ECT 583 Advanced Scripting Technologies  
ECT 588 E-Marketplace Technology  
ECT 590 E-Business Technology Practicum  
HCI 440 Usability Engineering  
IS 556 Enterprise Project Management  
SE 560 Structured Document Interchange and Processing

#### **in2 .** Wireless/Mobile Applications

ECT 455 E-Commerce Web Site Engineering  
ECT 565 Mobile Enterprise  
ECT 587 Mobile Commerce Technology  
HCI 440 Usability Engineering  
HCI 530 Usability Issues for Handheld Devices  
SE 540 Software Development for Mobile and Wireless Systems

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### Design/Development Oriented [dd]

#### **dd1 .** Application Development

ECT 455 E-Commerce Web Site Engineering  
ECT 557 Peer-To-peer Technology  
ECT 565 Mobile Enterprise  
ECT 583 Advanced Scripting Technologies  
ECT 587 Mobile Commerce Technology  
HCI 440 Usability Engineering  
IS 565 It Outsourcing  
IS 570 Enterprise System Implementation.  
SE 433 Software Testing  
SE 470 Software Development Processes  
SE 482 Requirements Engineering  
SE 560 Structured Document Interchange and Processing

#### **dd2 .** Software Engineering

ECT 556 Enterprise Architecture and Design  
IS 556 Enterprise Project Management  
SE 425 Principles and Practices of Software Engineering  
SE 450 Object-Oriented Software Development  
SE 452 Object-Oriented Enterprise Computing  
SE 470 Software Development Processes  
SE 480 Software Architecture  
SE 482 Requirements Engineering  
SE 529 Software Risk Management

## SE 550 Distributed Software Development

### **dd3 . e-Business Systems**

ECT 455 E-Commerce Web Site Engineering  
ECT 480 Intranets and Portals  
ECT 481 Internet Supply Chain Management  
ECT 557 Peer-To-peer Technology  
ECT 582 Secure Electronic Commerce  
ECT 583 Advanced Scripting Technologies  
ECT 587 Mobile Commerce Technology  
ECT 589 E-Commerce Technology Capstone  
ECT 590 E-Business Technology Practicum  
IS 535 Information Technology Investment Financial Analysis  
IS 556 Enterprise Project Management  
IS 560 Enterprise Systems  
IS 565 It Outsourcing  
IS 570 Enterprise System Implementation  
MGT 501 Strategic Supply Chain Management Kellstadt Graduate School of Business  
MKT 555 Decisions in Marketing Management Kellstadt Graduate School of Business

### **dd4 . HCI Methods**

ECT 557 Peer-To-peer Technology  
ECT 587 Mobile Commerce Technology  
HCI 430 Prototyping and Implementation  
HCI 440 Usability Engineering  
HCI 445 Inquiry Methods and Use Analysis  
HCI 450 Foundations of Human-Computer Interaction  
HCI 454 Interaction Design  
HCI 460 Usability Evaluation Methods  
IS 421 Information Systems Analysis

### **dd5. Enterprise Systems Integration**

ECT 480 Intranets and Portals  
ECT 481 Internet Supply Chain Management  
ECT 556 Enterprise Architecture and Design  
ECT 565 Mobile Enterprise  
ECT 584 Web Data Mining for Business Intelligence  
ECT 586 Customer Relationship Management Technologies  
IS 535 Information Technology Investment Financial Analysis  
IS 549 Data Warehousing and Data Mining  
IS 556 Enterprise Project Management  
IS 560 Enterprise Systems  
MGT 501 Strategic Supply Chain Management Kellstadt Graduate School of Business

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## Data Oriented [do]

### **do1. Database Design I**

CSC 449 Database Technologies  
CSC 451 Database Design  
CSC 452 Database Programming  
CSC 454 Database Administration and Management  
IS 549 Data Warehousing and Data Mining

### **do2 . Database Design II**

CSC 543 Spatial Databases and Geographic Information Systems  
CSC 550 Object-Oriented Databases  
CSC 551 Distributed Database Systems



CSC 553 Advanced Database Concepts  
IS 549 Data Warehousing and Data Mining  
IS 556 Enterprise Project Management

**do3. Data Mining & Analytics**

CSC 423 Data Analysis and Regression  
ECT 480 Intranets and Portals  
ECT 584 Web Data Mining for Business Intelligence  
ECT 586 Customer Relationship Management Technologies  
IS 549 Data Warehousing and Data Mining  
IS 567 Knowledge Discovery Technologies  
IS 574 Decision Support Systems and Intelligent Systems  
MKT 555 Decisions in Marketing Management Kellstadt Graduate School of Business

**do4. Knowledge Management**

CSC 480 Foundations of Artificial Intelligence  
ECT 480 Intranets and Portals  
IS 456 Knowledge Management Systems  
IS 512 Groupware and Virtual Collaboration  
IS 574 Decision Support Systems and Intelligent Systems  
IS 575 Intelligent Information Retrieval

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Infrastructure Oriented [if]

**if1. Network Design**

ECT 557 Peer-To-peer Technology  
ECT 587 Mobile Commerce Technology  
TDC 460 Foundations of Communications Systems  
TDC 463 Computer Networks and Data Systems  
TDC 511 Telecommunications Practicum  
TDC 564 Local Area Networks  
TDC 567 Telecommunication Systems Design and Management

**if2. Information Assurance & Security Design**

CNS 477 Legal Issues in Information Assurance  
CNS 594 Computer Information and Network Security Capstone  
ECT 582 Secure Electronic Commerce  
IS 433 Information Security Management  
IS 505 Business Continuity and Disaster Recovery  
IS 511 Social Issues of Computing  
IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance  
SE 473 Security Architecture I  
SE 529 Software Risk Management  
TDC 477 Network Security  
TDC 463 Computer Networks and Data Systems

**if3 . IT Architecture Design**

CSC 551 Distributed Database Systems  
DS 520 System Design and Implementation with Distributed Object Frameworks  
ECT 556 Enterprise Architecture and Design  
ECT 565 Mobile Enterprise  
ECT 590 E-Business Technology Practicum  
IS 535 Information Technology Investment Financial Analysis  
IS 556 Enterprise Project Management  
SE 450 Object-Oriented Software Development  
SE 473 Security Architecture I  
SE 480 Software Architecture  
SE 554 Enterprise Component Architecture

## Elective Course Restrictions

Elective courses are in the range of 420-699 and must be from the school of CTI. Credit for courses taken outside of the school will only be given if approved by a faculty advisor. Courses suggested for any Prerequisite Phase in any concentration do not count for elective credit. Any course required for the students concentration but taken as part of the requirements of another degree earned by the student may be waived, but cannot be used for elective credit.

## Master of Science in Human Computer Interaction

### About

The **Masters Program in Human-Computer Interaction** provides students with skills and expertise for designing, prototyping and testing user interfaces and web sites.

The **Master of Science in Human-Computer Interaction** at DePaul prepares students to design, implement, and evaluate computer interfaces so that they are accessible and easy for people to use. This interdisciplinary degree integrates concepts and methods from computer science, graphic design and the social sciences to provide a comprehensive understanding of the user-centered design process.

### What Students Will Learn From This Program

- Carry out the full user-centered design process
- Conduct usability tests
- Perform research on users and their tasks
- Create the information architecture for a web site or complex application
- Develop working prototypes of dynamic web sites

### Program Information

The program has five phases, with each phase preparing the student for the subsequent phase. The masters degree program consists of:

Prerequisite Courses  
Fundamentals Courses  
Core Courses  
Advanced Phase Courses  
Capstone Course

Upon acceptance into the masters degree program, the student will meet with a faculty advisor to discuss Prerequisite courses. The Prerequisite courses are intended to ensure that all students enter graduate courses with an equivalent background. The Fundamental courses offer knowledge in the multiple disciplines that contribute to HCI. Students in the Core courses acquire an understanding of the technological and theoretical foundations, and the Advanced Phase provides students the opportunity to study specialized topics in greater depth. This phase adds depth to the work completed in the previous phases. The degree culminates in the

experience of the Capstone Course where students undertake a comprehensive project involving analysis, design, implementation and evaluation.

Grade and GPA requirements

Prerequisite Courses

Fundamentals Courses

Core Courses

Advanced Phase Courses

Capstone Course

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Human Computer Interaction □ Grade and GPA requirements

## Grade and GPA requirements

**Grades** : Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.

**GPA** : Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.90 or higher will graduate with distinction.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Human Computer Interaction □ Prerequisite Courses

## Prerequisite Courses

The courses in the Prerequisite Phase for the MS in Human-Computer Interaction are listed below.

IT 130 The Internet and the Web [Self Placement Test Available!](#)

IT 223 Data Analysis [Self Placement Test Available!](#)

IM 230 Scripting for Interactive Media

IM 332 User-Centered Web Development

HCI 402 Foundations of Digital Design

Students who intend to take implementation courses at the graduate level are encouraged to complete CSC 212, CSC 396 or CSC 224.

By taking these courses and receiving a grade of a B- or better in each, the student will have completed the requirements of the Prerequisite Phase. All or part of the Prerequisite Phase may be waived if a student has the equivalent academic background. Alternatively, students with practical experience may complete a Graduate Assessment Examination (GAE) to show competency in a prerequisite. The student must submit an online Change of Status request when the Prerequisite Phase is completed to inform the Student Services offices that the block can be removed. The online request must be submitted two weeks before the student intends to register for graduate level classes. The student will then be considered a fully admitted student, and may pass to the Graduate Phase of the program. Students may submit the Change of Status request by logging in to MyCTI.

## **Fundamentals Courses**

Students should complete their Prerequisite courses before beginning the Fundamental courses. However, while completing the Prerequisite courses, students may take Fundamental courses with consent of their faculty advisor. The Fundamental courses for the MS in Human-Computer Interaction are:

HCI 440 Usability Engineering  
HCI 450 Foundations of Human-Computer Interaction  
HCI 470 Digital Page Formatting I

## **Core Courses**

Students must complete all Prerequisite courses and should be finishing Fundamental courses before taking Core courses.

The Core courses are:

HCI 430 Prototyping and Implementation  
HCI 445 Inquiry Methods and Use Analysis  
HCI 460 Usability Evaluation Methods  
HCI 454 Interaction Design

## **Advanced Phase Courses**

Students must complete four courses either from the HCI offering or from the courses listed below, plus one advisor-approved elective from the School of CTI. All advanced phase courses in CTI must be numbered 420 or higher.

The HCI offering includes: (but is not limited to)

HCI 422 Multimedia  
HCI 432 User-Centered Web Development  
HCI 511 Designing for Disabilities  
HCI 530 Usability Issues for Handheld Devices  
HCI 590 Topics in Human-Computer Interaction

Non-HCI Advanced phase courses open to all HCI graduate students

CSC 423 Data Analysis and Regression

CSC 424 Advanced Data Analysis  
CSC 428 Data Analysis for Experimenters  
CSC 449 Database Technologies  
CSC 451 Database Design  
CSC 587 Cognitive Science  
ECT 433 Survey of Web Programming Technologies  
ECT 455 E-Commerce Web Site Engineering  
ECT 480 Intranets and Portals  
ECT 586 Customer Relationship Management Technologies  
IS 456 Knowledge Management Systems  
IS 511 Social Issues of Computing  
IS 512 Groupware and Virtual Collaboration  
IS 570 Enterprise System Implementation  
ITS 427 Learning and Technology  
ITS 431 Instructional Delivery and Course Management Systems  
ITS 560 Training and User Support  
PSY 402 Perceptual Processes  
PSY 404 Learning and Cognitive Processes  
PSY 473 The Psychology of Judgment and Decision- Making  
PSY 557 Seminar in Learning and Cognitive Processes  
PSY 680 Industrial and Organizational Psychology  
SE 477 Software and Systems Project Management

Advanced phase courses open to students with programming experience.

GPH 425 Survey of Computer Graphics  
GPH 438 Computer Animation Survey  
SE 430 Object Oriented Modeling

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Human Computer Interaction □ Capstone Course

## Capstone Course

HCI 594 Human-Computer Interaction Capstone

## Master of Science in Information Systems

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Information Systems

### About

The **Master of Science in Information Systems** program combines emphasis on technical and managerial expertise including IT project management, enterprise system implementation, systems analysis & design, IT organizational management, IT consulting, database administration, and Internet applications.

**The MS in Information Systems** focuses on the planning, development and management of information systems that enable organizations to gain strategic and tactical competitive advantage.

Today organizations expect IS professionals to be familiar with a variety of information technology solutions

as well as business disciplines. This program helps students attain multiple competencies as IS professionals when information technology solutions are constantly evolving.

FIND OUT MORE AT THE INFORMATION SYSTEMS PROGRAMS WEBSITE:

<http://www.cti.depaul.edu/programs/is>

### **Competency Modules**

Several modules are available to allow students to focus in-depth on a variety of information systems competency areas.

With **19 Competency Modules** available, students can choose those that best meet their current and future career plans. Students can gain expertise in managing technology while enhancing specific technical skills:

- Application Development
- Database Design I
- Database Design II
- Data Mining & Analytics
- e-Business Systems
- Enterprise Systems Integration
- HCI Methods
- IT Architecture Design
- IT Project Management I
- IT Project Management II
- IT Planning and Global Strategies
- IT Regulatory Compliance
- Internet Application Development
- Information Assurance & Security Design
- Knowledge Management
- Legal & Social Issues
- Network Design
- Wireless/Mobile Applications

### **What Students Learn From The Program**

- foundational systems design skills
- IT project management knowledge and skills
- data-driven technologies such as data mining, supply chain management (SCM), customer relationship management (CRM)
- enterprise systems management
- advanced systems architecture and design skills

### **Program Information**

The program follows a four-phase sequence, with each phase preparing the student for the subsequent phase. The masters degree program consists of:

Prerequisite Phase

Foundation Phase

Advanced Phase

Capstone Course

Competency/Course Cross List

Upon acceptance into the masters degree program, the student will meet with a faculty advisor to discuss required courses for the Prerequisite Phase. The Prerequisite Phase is intended to ensure that all students enter graduate courses with an equivalent background. While completing this phase, a student is considered a conditionally admitted masters student.

After the Prerequisite Phase, the student will complete 13 graduate level courses to meet degree requirements. In the Foundation Phase, a student will follow a sequence of courses to acquire an understanding of the technological and theoretical foundations for the particular degree. In the Advanced Phase of the program, the fundamental information learned previously allows a student to study advanced topics within their chosen degree with eight courses. This phase adds depth to the work completed in the Foundation Phase. Individual interests and needs are also addressed through a series of elective courses chosen in consultation with the students faculty advisor. The student finishes the MS program with IS 577, the

capstone course

Grade and GPA requirements

Prerequisite Phase

Foundation Phase

Advanced Phase

Capstone Course

Advanced Elective Restrictions

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Information Systems □ Grade and GPA requirements

## Grade and GPA requirements

**Grades** : Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.

**GPA** : Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.90 will graduate with distinction.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Information Systems □ Prerequisite Phase

## Prerequisite Phase

The courses in the Prerequisite Phase for the MS in Information Systems are:

CSC 211 Programming in Java I [Self Placement Test Available!](#)

CSC 212 Programming in Java II

or CSC 224 Java for Programmers [Self Placement Test Available!](#)

or CSC 396 Programming in Java I and II

IT 215 Analysis and Design Techniques [Self Placement Test Available!](#)

ECT 310 Internet Application Development

CSC 224 is equivalent to both CSC 211 and CSC 212. Only students with experience in programming languages should take CSC 224. By taking these courses and receiving a grade of a B- or better in each, the student will have completed the requirements of the Prerequisite Phase. All or part of the Prerequisite Phase may be waived if a student has the equivalent academic background. Alternatively, students with practical experience may complete a Graduate Assessment Examination (GAE) to show competency in a prerequisite. All students are blocked from enrolling in Foundation Knowledge Phase courses prior to completing their prerequisites. The student must submit an online Change of Status request when the Prerequisite Phase is completed to inform the Student Services offices that the block can be removed. The online request must be submitted two weeks before the student intends to register for graduate level classes. The student will then be considered a fully admitted student, and may pass to the Graduate Phase of the program. Students may submit the Change of Status request by logging in to MyCTI.

## Foundation Phase

Fully admitted students in the Foundation Knowledge phase may register for a maximum of four Advanced phase courses. The Foundation Knowledge phase courses for the MS in Information Systems are:

IS 425 Enterprise Information  
CSC 451 Database Design  
ECT 425 Technical Fundamentals of Distributed Information Systems  
SE 430 Object Oriented Modeling

## Advanced Phase

Advanced Phase (8 elective courses, at least three are 500-level courses)

The advanced phase is designed to meet a student's career goals in Information Systems. With numerous predefined competency modules, a student can gain expertise in more than one area. There are two choices open to a student:

The student may attain two or more competencies, by taking at least four courses listed under each competency module. Because some courses, such as IS 556 (enterprise project management), are shared by several modules, it is possible to attain more than two competencies. A student should pick competencies based on their career goals and preferences. For example, a student can pick Application Development and Project Management I for a career as project manager, can pick Project Management I and Project Management II for a Project Management Office executive, or can pick E-Business Systems and Enterprise Systems Integration for a career as a web enterprise systems integrator.

If a competency does not exist that meets a student's career plans, a student can also design a personal breadth competency consisting of a maximum of 8 courses with advisor approval.

### Information Systems Modules

#### *IT Management Oriented [mn]*

- mn1. IT Project Management I
- mn2. IT Project Management II
- mn3. IT Planning and Global Strategies
- mn4. Legal & Social Issues
- mn5. IT Regulatory Compliance

#### *Internet Oriented [in]*

- in1. Internet Application Development
- in2. Wireless/Mobile Applications

#### *Design/Development Oriented [dd]*

- dd1. Application Development
- dd2. Software Engineering
- dd3. e-Business Systems
- dd4. HCI Methods



## dd5. Enterprise Systems Integration

### *Data Oriented [do]*

- do1. Database Design I
- do2. Database Design II
- do3. Data Mining & Analytics
- do4. Knowledge Management

### *Infrastructure Oriented [if]*

- if1. Network Design
  - if2. Information Assurance & Security Design
  - if3. IT Architecture Design
- 

### *IT Management Oriented [mn]*

#### **mn1.** IT Project Management I

- IS 483 Information Services and Operations
- IS 512 Groupware and Virtual Collaboration
- IS 535 Information Technology Investment Financial Analysis
- IS 556 Enterprise Project Management
- IS 560 Enterprise Systems
- IS 570 Enterprise System Implementation.
- SE 433 Software Testing
- SE 468 Software Measurement/Project Estimation
- SE 477 Software and Systems Project Management
- ACC 500 Financial Accounting Kellstadt Graduate School of Business
- MGT 500 Managing Effective and Ethical Organizational Behavior Kellstadt Graduate School of Business

#### **mn2.** IT Project Management II

- ECT 556 Enterprise Architecture and Design
- ECT 589 E-Commerce Technology Capstone
- IS 511 Social Issues of Computing
- IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance
- IS 556 Enterprise Project Management
- IS 565 IT Outsourcing
- IS 578 Information Technology Consulting
- SE 529 Software Risk Management
- MGT 562 Resolving Conflict in Organizations Kellstadt Graduate School of Business
- MGT 563 Negotiation Skills Kellstadt Graduate School of Business

#### **mn3.** IT Planning and Global Strategies

- ECT 556 Enterprise Architecture and Design
- ECT 565 Mobile Enterprise
- ECT 589 E-Commerce Technology Capstone
- IS 483 Information Services and Operations
- IS 512 Groupware and Virtual Collaboration
- IS 535 Information Technology Investment Financial Analysis
- IS 540 Global Information Technology
- IS 560 Enterprise Systems
- IS 577 Information Systems Capstone
- IT 599 Topics in Global Information Technology
- ACC 500 Financial Accounting Kellstadt Graduate School of Business
- MGT 501 Strategic Supply Chain Management Kellstadt Graduate School of Business

#### **mn4.** Legal & Social Issues

- ECT 585 Legal Aspects of E-Commerce
- IS 433 Information Security Management
- IS 482 Legal Aspects of Information Technology

IS 511 Social Issues of Computing  
IS 565 IT Outsourcing  
IS 570 Enterprise System Implementation.  
IT 599 Topics in Global Information Technology  
TDC 569 Telecommunication Regulation, Policy,law and Standards

**mn5 . IT Regulatory Compliance**

CNS 477 Legal Issues in Information Assurance  
IS 433 Information Security Management  
IS 505 Business Continuity and Disaster Recovery  
IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance  
IS 535 Information Technology Investment Financial Analysis  
IS 556 Enterprise Project Management  
IS 560 Enterprise Systems

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*Internet Oriented [in]*

**in1. Internet Application Development**

ECT 455 E-Commerce Web Site Engineering  
ECT 556Enterprise Architecture and Design  
ECT 557 Peer-To-peer Technology  
ECT 583 Advanced Scripting Technologies  
ECT 588 E-Marketplace Technology  
ECT 590 E-Business Technology Practicum  
HCI 440 Usability Engineering  
IS 556 Enterprise Project Management  
SE 560 Structured Document Interchange and Processing

**in2. Wireless/Mobile Applications**

ECT 455 E-Commerce Web Site Engineering  
ECT 565 Mobile Enterprise  
ECT 587Mobile Commerce Technology  
HCI 440 Usability Engineering  
HCI 530 Usability Issues for Handheld Devices  
SE 540 Software Development for Mobile and Wireless Systems

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*Design/Development Oriented [dd]*

**dd1. Application Development**

ECT 455 E-Commerce Web Site Engineering  
ECT 557 Peer-To-peer Technology  
ECT 565 Mobile Enterprise  
ECT 583 Advanced Scripting Technologies  
ECT 587Mobile Commerce Technology  
HCI 440 Usability Engineering  
IS 565 IT Outsourcing  
IS 570 Enterprise System Implementation.  
SE 433 Software Testing  
SE 470 Software Development Processes  
SE 482 Requirements Engineering  
SE 560 Structured Document Interchange and Processing

**dd2. Software Engineering**

ECT 556Enterprise Architecture and Design

IS 556 Enterprise Project Management  
SE 425 Principles and Practices of Software Engineering  
SE 450 Object-Oriented Software Development  
SE 452 Object-Oriented Enterprise Computing  
SE 470 Software Development Processes  
SE 480 Software Architecture  
SE 482 Requirements Engineering  
SE 529 Software Risk Management  
SE 550 Distributed Software Development

**dd3. e-Business Systems**

ECT 455 E-Commerce Web Site Engineering  
ECT 480 Intranets and Portals  
ECT 481 Internet Supply Chain Management  
ECT 557 Peer-To-peer Technology  
ECT 582 Secure Electronic Commerce  
ECT 583 Advanced Scripting Technologies  
ECT 587 Mobile Commerce Technology  
ECT 589 E-Commerce Technology Capstone  
ECT 590 E-Business Technology Practicum  
IS 535 Information Technology Investment Financial Analysis  
IS 556 Enterprise Project Management  
IS 560 Enterprise Systems  
IS 565 IT Outsourcing  
IS 570 Enterprise System Implementation.  
MGT 501 Strategic Supply Chain Management Kellstadt Graduate School of Business  
MKT 555 Decisions in Marketing Management Kellstadt Graduate School of Business

**dd4. HCI Methods**

ECT 557 Peer-To-peer Technology  
ECT 587 Mobile Commerce Technology  
HCI 430 Prototyping and Implementation  
HCI 440 Usability Engineering  
HCI 445 Inquiry Methods and Use Analysis  
HCI 450 Foundations of Human-Computer Interaction  
HCI 454 Interaction Design  
HCI 460 Usability Evaluation Methods  
IS 421 Information Systems Analysis

**dd5. Enterprise Systems Integration**

ECT 480 Intranets and Portals  
ECT 481 Internet Supply Chain Management  
ECT 556 Enterprise Architecture and Design  
ECT 565 Mobile Enterprise  
ECT 584 Web Data Mining for Business Intelligence  
ECT 586 Customer Relationship Management Technologies  
IS 535 Information Technology Investment Financial Analysis  
IS 549 Data Warehousing and Data Mining  
IS 556 Enterprise Project Management  
IS 560 Enterprise Systems  
MGT 501 Strategic Supply Chain Management Kellstadt Graduate School of Business

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*Data Oriented [do]*

**do1. Database Design I**

CSC 449 Database Technologies  
CSC 451 Database Design

CSC 452 Database Programming  
CSC 454 Database Administration and Management  
IS 549 Data Warehousing and Data Mining

**do2. Database Design II**

CSC 543 Spatial Databases and Geographic Information Systems  
CSC 550 Object-Oriented Databases  
CSC 551 Distributed Database Systems  
CSC 553 Advanced Database Concepts  
IS 549 Data Warehousing and Data Mining  
IS 556 Enterprise Project Management

**do3. Data Mining & Analytics**

CSC 423 Data Analysis and Regression  
ECT 480 Intranets and Portals  
ECT 584 Web Data Mining for Business Intelligence  
ECT 586 Customer Relationship Management Technologies  
IS 549 Data Warehousing and Data Mining  
IS 567 Knowledge Discovery Technologies  
IS 574 Decision Support Systems and Intelligent Systems  
MKT 555 Decisions in Marketing Management Kellstadt Graduate School of Business

**do4. Knowledge Management**

CSC 480 Foundations of Artificial Intelligence  
ECT 480 Intranets and Portals  
IS 456 Knowledge Management Systems  
IS 512 Groupware and Virtual Collaboration  
IS 574 Decision Support Systems and Intelligent Systems  
IS 575 Intelligent Information Retrieval

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*Infrastructure Oriented [if]*

**if1. Network Design**

ECT 557 Peer-To-peer Technology  
ECT 587 Mobile Commerce Technology  
TDC 460 Foundations of Communications Systems  
TDC 463 Computer Networks and Data Systems  
TDC 511 Telecommunications Practicum  
TDC 564 Local Area Networks  
TDC 567 Telecommunication Systems Design and Management

**if2. Information Assurance & Security Design**

CNS 477 Legal Issues in Information Assurance  
CNS 594 Computer Information and Network Security Capstone  
ECT 582 Secure Electronic Commerce  
IS 433 Information Security Management  
IS 505 Business Continuity and Disaster Recovery  
IS 511 Social Issues of Computing  
IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance  
SE 473 Security Architecture I  
SE 529 Software Risk Management  
TDC 477 Network Security  
TDC 463 Computer Networks and Data Systems

**if3. IT Architecture Design**

CSC 551 Distributed Database Systems  
DS 520 System Design and Implementation with Distributed Object Frameworks  
ECT 556 Enterprise Architecture and Design  
ECT 565 Mobile Enterprise  
ECT 590 E-Business Technology Practicum  
IS 535 Information Technology Investment Financial Analysis  
IS 556 Enterprise Project Management  
SE 450 Object-Oriented Software Development  
SE 473 Security Architecture I  
SE 480 Software Architecture  
SE 554 Enterprise Component Architecture  
TDC 463 Computer Networks and Data Systems  
TDC 567 Telecommunication Systems Design and Management

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Information Systems □ Advanced Elective Restrictions

### **Advanced Elective Restrictions**

Elective courses are in the range of 420-699 and must be from the school of CTI. Credit for courses taken outside of the school will only be given if approved by a faculty advisor. Courses suggested for any Prerequisite Phase in any concentration do not count for elective credit. Any course required for the students concentration but taken as part of the requirements of another degree earned by the student may be used to satisfy a competency, but cannot be used to satisfy the 8 elective course requirement.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Information Systems □ Capstone Course

### **Capstone Course**

IS 577 Information Systems Capstone

## **Master of Arts in Information Technology**

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Arts in Information Technology

### **About**

The **Master of Arts in Information Technology Program** is intended to prepare professionals in the broad field of Information Technology. In particular, the program prepares graduates to interact professionally with technologists, write about IT, manage impacts of IT on organizations or society, or evaluate IT-oriented data.

The goal of the MA in Information Technology program is to prepare someone in a non-technical position to interact effectively with the technical staff and customers.

### **What Students Learn From The Program**

- The concepts, tools, and practices of information technology management.
- The analysis phase of the software development life cycle.
- The fundamentals of networks for voice and data communications and for the integration of voice and data streams,
- The methods and problems associated with technology-triggered business transformation.
- The basics of database design.
- The fundamentals of project management for software systems.
- The skills to acquire and analyze data.

Prerequisite Phase

Foundation Phase

Advanced Phase

Culminating Phase

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Arts in Information Technology □ Grade and GPA Requirement

## Grade and GPA Requirement

**Grades** : Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.

**GPA** : Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.90 will graduate with distinction.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Arts in Information Technology □ Prerequisite Phase

## Prerequisite Phase

The courses in the Prerequisite Phase for the MA in Information Technology are:

IT 130 The Internet and the Web [Self Placement Test Available!](#)  
 IT 223 Data Analysis  
 IT 230 Building Internet Applications  
 TDC 361 Basic Communication Systems

By taking these courses and receiving a grade of a B- or better in each, the student will have completed the requirements of the Prerequisite Phase. All or part of the Prerequisite Phase may be waived if a student has the equivalent academic background. Alternatively, students with practical experience may complete a Graduate Assessment Examination (GAE) to show competency in a prerequisite. All students are blocked from enrolling in Foundation Phase courses prior to completing their prerequisites. The student must submit a Change of Status request when the Prerequisite Phase is completed to inform the Student Services offices that the block can be removed. The form must be submitted two weeks before the student intends to register for graduate level classes. The student will then be considered a fully admitted student, and may pass to the Foundation Phase of the program. Students may submit the Change of Status request by logging in to MyCTI.

## Foundation Phase

Fully admitted students in the Foundation Phase may register for a maximum of four Advanced phase courses. The Foundation Phase courses for the MA in Information Technology are:

CSC 423 Data Analysis and Regression  
HCI 445 Inquiry Methods and Use Analysis  
HCI 440 Usability Engineering  
CSC 451 Database Design  
IS 511 Social Issues of Computing  
IS 556 Enterprise Project Management  
ECT 455 E-Commerce Web Site Engineering

## Advanced Phase

The advanced phase provides opportunities for breadth and depth in IT, and allows for specialized interests through five elective courses for which you have required prerequisites. Listed below are suggested courses. Two of the five elective courses must be taken at the 500 level.

CSC 424 Advanced Data Analysis  
CSC 428 Data Analysis for Experimenters  
CSC 449 Database Technologies  
ECT 480 Intranets and Portals  
ECT 556 Enterprise Architecture and Design  
ECT 565 Mobile Enterprise  
ECT 585 Legal Aspects of E-Commerce  
ECT 586 Customer Relationship Management Technologies  
ECT 589 E-Commerce Technology Capstone  
HCI 450 Foundations of Human-Computer Interaction  
HCI 454 Interaction Design  
HCI 460 Usability Evaluation Methods  
IPD 499 Topics in Global Information Technology  
IS 425 Enterprise Information  
IS 570 Enterprise System Implementation.  
IS 456 Knowledge Management Systems  
IS 482 Legal Aspects of Information Technology  
IS 483 Information Services and Operations  
IS 505 Business Continuity and Disaster Recovery  
IS 512 Groupware and Virtual Collaboration  
IS 540 Global Information Technology  
IS 560 Enterprise Systems  
IS 433 Information Security Management  
IS 577 Information Systems Capstone  
IS 578 Information Technology Consulting  
IS 596 Topics in Information Systems  
ITS 560 Training and User Support  
SE 430 Object Oriented Modeling  
SE 477 Software and Systems Project Management  
TDC 463 Computer Networks and Data Systems

TDC 464 Voice Communication Networks  
TDC 476 Economics of Telecommunication Systems  
TDC 511 Telecommunications Practicum  
TDC 569 Telecommunication Regulation, Policy,law and Standards

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Arts in Information Technology □ Culminating Thesis

## **Culminating Thesis**

The Culminating Thesis is an independent research article that demonstrates a student's ability to integrate both technical expertise and IT domain knowledge. Normally, it is undertaken during the student's final year in the MA program.

In this work, the student is guided and assessed by a Thesis supervisor. The thesis must represent an original contribution, and may include system evaluation, empirical studies, or theoretical work. The scope and the details of the research project will be determined by the supervisor, and must be approved by the student's academic advisor.

IT 698 Masters Thesis is a two-credit hour course. Students must register for this course a minimum of two times and must continue to enroll in the course in every quarter after the first quarter until the thesis is completed to the satisfaction of their supervisor. A maximum of four credit hours will apply for degree credit.

## **Master of Science in Instructional Technology Systems**

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Instructional Technology Systems

### **About**

The **Master of Science degree in Instructional Technology Systems** prepares students to use modern technology to develop, deliver, and assess training and educational material.

Graduates will be well-positioned to lead the growing market in web-delivered, global training and education. The program starts by giving students a firm foundation in current learning science, focusing on the proven principles for using technology in learning environments. The other leg of the program focuses on using technology to create and disseminate learning materials, for example, with multimedia, animations, simulations, and games. On top of this foundation, students will get an in-depth understanding of the use and customization of Learning Management Systems, and how to design content for them that can effectively train and educate the users.

### **What Students Learn From The Program**

- The current science of how people learn, focusing on principles for learning with technology.
- The ability to design and implement materials for learning with technology, including multimedia (audio, graphics, video), simulations, and games.
- The ability to use and customize Learning Management Systems for effective delivery of training / educational materials.
- The ability to work with online collaborative environments like Social Networks, Blogs/discussion boards, Wikis, etc, for effective training.

### **Program Information**



The program has four phases, with each phase preparing the student for the subsequent phase. The masters degree program consists of:

- Prerequisite Courses
- Required Courses
- Elective Courses
- Capstone Course

Grade and GPA requirements

Prerequisite Courses

Required Courses

Elective Courses

Capstone Course

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Instructional Technology Systems □ Grade and GPA requirements

## Grade and GPA requirements

**Grades:** Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.

**GPA:** Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.90 will graduate with distinction.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Instructional Technology Systems □ Prerequisite Courses

## Prerequisite Courses

The courses in the Prerequisite Phase for the MS in Instructional Technology Systems are:

- IT 223 Data Analysis [Self Placement Test Available!](#)
- IM 220 Interactive Media I
- IM 230 Scripting for Interactive Media
- IM 270 User-Centered Web Design

By taking these courses and receiving a grade of a B- or better in each, the student will have completed the requirements of the Prerequisite Phase. All or part of the Prerequisite Phase may be waived if a student has the equivalent academic background. Alternatively, students with practical experience may complete a Graduate Assessment Examination ((GAE) to show competency in a prerequisite. All students are blocked from enrolling in the graduate phase of the degree prior to completing their prerequisites. The student must submit an online Change of Status request when the Prerequisite Phase is completed to inform the Student Services offices that the block can be removed. The online request must be submitted two weeks before the student intends to register for graduate level classes. The student will then be considered a fully admitted student, and may pass to the Graduate Phase of the program. Students may submit the Change of Status request by logging in to MyCTI.

## Required Courses

Students should complete their Prerequisite courses before beginning the Required courses. However, while completing the Prerequisite courses, students may take Required courses with consent of their faculty advisor. The Required courses for the MS in Instructional Technology Systems are:

HCI 430 Prototyping and Implementation  
HCI 440 Usability Engineering  
PM 440 Collaborative Technology for Leading Projects  
ITS 427 Learning and Technology  
ITS 431 Instructional Delivery and Course Management Systems  
ITS 560 Training and User Support  
TDC 425 Voice/Data Network Fundamentals

## Elective Courses

Three (3) courses from the list, plus two (2) open electives from CTI courses numbered 420-599

CNS 477 Legal Issues in Information Assurance  
CSC 423 Data Analysis and Regression  
CSC 424 Advanced Data Analysis  
CSC 428 Data Analysis for Experimenters  
CSC 451 Database Design  
CSC 587 Cognitive Science  
ECT 433 Survey of Web Programming Technologies  
HCI 422 Multimedia  
HCI 450 Foundations of Human-Computer Interaction  
IS 433 Information Security Management  
IS 456 Knowledge Management Systems  
IS 511 Social Issues of Computing  
IS 570 Enterprise System Implementation.  
IS 511 Social Issues of Computing  
ITS 440 Distance Learning Technologies  
ITS 584 Artificial Intelligence in Learning Environments  
PM 430 Fundamentals of IT Project Management  
PSY 404 Learning and Cognitive Processes  
PSY 445 Advanced Training and Development in Organizations  
SNL 616 Designing Educational Offerings  
SNL 617 Facilitating Adults Learning  
SNL 626 Assessing Learning and Evaluating Programs  
SNL 700 Learning Plan Research and Development

## Capstone Course

ITS 589 ITS Capstone Projects Course

## Master of Science in IT Project Management

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in IT Project Management

### About

The **Master of Science in IT Project Management** is for working professionals who have either a technology undergraduate degree or two years of IT work experience and wish to advance their careers by filling the growing need for IT project managers.

The **MS in IT Project Management** is intended for graduate students who wish to prepare for careers leading and managing IT project teams. The lack of project and program management skills has long been known to be a major factor in IT project failures.

Over the past decade, it has become apparent that placing individuals with strong training in the breadth of project management skills significantly improves the likelihood of bringing an IT project in successfully on time, and on budget.

This growing awareness is leading to increased demand for skilled IT project and program managers. But demand for these skills currently outstrips the supply of qualified candidates.

This is a high-level program preparing graduates for mid to high level project and program management positions. Core IT skills are assumed. Students focus on leveraging those skills to build leadership practices that enable quality work.

### What Students Learn From The Program

- In-depth knowledge of project management skills, including risk management, procurement and contract management, time and cost estimating, controlling and tracking techniques (scope statements, work breakdown structures, Gantt, PERT, etc.); and IT testing, quality assurance, and control.
- Familiarity with those elements of human resource management that are key to project management success, such as team building, motivating, communicating through traditional and electronic means, negotiating and influencing, coordinating, and managing organizational change.
- Basic general knowledge of business systems and processes, including knowledge of introductory accounting and the basics of cost accounting as applied in IT project management
- Ability to effectively use common project management software packages
- Familiarity with program management and the skills to mitigate risk across a portfolio of projects.

### Program Information

Unlike other CTI graduate programs that admit students regardless of technical background, the MS in IT Project Management is designed for students who possess a Bachelors degree or significant work experience in an IT related area. Examples of such areas include (but are not limited to) CIS, IS, MIS, ECE, Networking. Students whose undergraduate degree is in an unrelated area will be required to produce evidence of at least two years of responsible work experience as a computer programmer, systems analyst, business analyst, or similar position where the workload is primarily centered on Information Technology and the student had significant exposure to the system development process.

This requirement for an IT undergraduate degree or prior work experience is unique among CTI Masters degrees, and is based in the fact that IT professionals are expected to have knowledge in the IT field before moving into project management positions.

- Foundation courses (24 quarter hours)
- Electives (24 quarter hours)
- Capstone course (4 quarter hours)

Grade and GPA Requirements

Elective Courses

Capstone Course

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in IT Project Management □ Grade and GPA Requirements

## Grade and GPA Requirements

**Grades:** Students must receive a grade of C- or better all other courses.

**GPA:** Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.90 or higher will graduate with distinction.

Foundation Courses

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in IT Project Management □ Foundation Courses

## Foundation Courses

### Six Required Courses

IS/PM 430 Fundamentals of IT Project Management  
 IS/PM 440 Collaborative Technologies for Leading Projects  
 IS/PM 535 Information Technology Investment Financial Analysis  
 IS/PM 556 Enterprise Project Management  
 IS/PM 570 Enterprise System Implementation  
 MGT 500 Managing Effective and Ethical Organizational Behavior

An IS/PM course subject means that IS XXX is cross-listed with PM XXX

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in IT Project Management □ Elective Courses

## Elective Courses

Twenty-four quarter hours are required from the following list, with a minimum of twelve of these quarter hours taken from CTI. These electives cover a broad range of technical, managerial, and information systems topics. Students should work closely with their advisor to identify and select courses most directly associated

with their career plans.

***CTI Electives (all 4 quarter hours)***

IS 433 Information Security Management  
IS 456 Knowledge Management Systems  
IS 483 Information Technology Operations and Services  
IS 505 Business Continuity and Disaster Recovery  
IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance  
IS 540 Global Information Technology  
IS 565 Information Technology Outsourcing  
IS 578 Information Technology Consulting  
SE 425 Principles and Practices of Software Engineering\*  
SE 427 Software Quality Management  
SE 430 Object Oriented Modeling\*  
SE 468 Software Measurement/Project Estimation  
SE 470 Software Development Processes  
SE 482 Requirements Engineering  
SE 529 Software Risk Management

Note: Courses marked with an \* are the more technical electives, and require two courses of object oriented coding, or consent of the instructor.

***Kellstadt Electives (all 4 quarter hours)***

ACC 500 Financial Accounting  
ACC 555 Management Accounting for Decision-Making  
MGT 500 Managing Effective and Ethical Organizational Behavior  
MGT 530 Leadership in Organizations  
MGT 555 Strategic Management of Human Resources  
MGT 562 Resolving Conflict in Organizations  
MGT 563 Negotiation Skills  
MGT 565 Employment Law

***SNL Electives (3 quarter hours)***

SNL 745 Improving Team Effectiveness  
SNL 755 Valuing Human Differences  
SNL 765 Engaging Ethical Reasoning

***SNL Special Topics Seminars (1 quarter hour)***

SNL 598 Special Topics

These seminars meet each quarter. Current and relevant topics are explored. Examples of recent Special Topics seminars include: Knowledge Management, After-Action Reviews, National Security and the "Database Problem," E-commerce: Back to Basics, Reflective Practice, The Technology Behind Everyday Interactions, and Innovative Processes.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in IT Project Management □ Capstone Course

**Capstone Course**

***Capstone (4 quarter hours)***

PM 577 Project Management Practicum Capstone

# Master of Science in Software Engineering

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Software Engineering

## About

The **Master of Science in Software Engineering** provides students with skills that are widely applicable, highly in demand and richly rewarded.

**The MS in Software Engineering** at DePaul CTI provides students with the theoretical foundations of software engineering, a discipline concerned with the practical problems of developing large-scale software systems.

Students gain experience and exposure to the most recent developments in software engineering through team projects in software development and project management. The Software Engineering curriculum encompasses all important aspects of software engineering, including:

- software engineering processes
- requirements engineering
- software architecture and design
- software construction, software testing
- software maintenance
- software configuration management
- software project management
- software quality assurance

The Software Engineering program provides students with highly marketable skills and knowledge in state-of-the-art software engineering methodologies, techniques, and applications. It also emphasizes the development of communication and presentation skills in a team-based software development environment.

## Concentrations

**The Project Management Concentration** addresses the management of the quality of software products and processes and provides coursework in management and measurement techniques.

**The Software Development Concentration** addresses the foundations, methodologies, and tools for developing high quality large-scale software systems, with an emphasis on the technical issues of software development.

**The Software Architecture Concentration** addresses the management and design of large-scale software systems.

**The Systems Analysis Concentration** addresses requirements engineering and quality assurance of large-scale or enterprise-level software systems solutions.

**The Gaming and Entertainment Technologies Concentration** addresses the foundations, methodologies

## What Students Learn From The Program

- Technical foundations in object-oriented analysis, modeling, architecture, design, and construction
- Communication skills and experiences in collaborative and team-based software development
- Knowledge and skills in software project management, configuration management, and quality assurance
- Knowledge in software development process improvement and experience in agile and iterative software development process
- Technical know-how in developing, integrating, and deploying web-based enterprise applications and service oriented architecture (SOA)

## Program Information

The Software Engineering program has two phases:

Prerequisite Phase

Graduate Phase

The Prerequisite Phase ensures that all students acquire the necessary background prior to enrolling in graduate courses. All or part of the Prerequisite Phase may be waived if a student has the equivalent academic background. In the Graduate Phase, students develop as software engineering professionals by completing required courses that provide a common body of knowledge for their concentration as well as advanced courses that complement and add depth to the common body of knowledge. All students also participate in an extensive team software development project and the Software Engineering Research Seminar. Individual needs are addressed through elective courses chosen in consultation with a faculty advisor.

Grade and GPA requirements

Prerequisite Phase

Graduate Phase

Grade and GPA Requirements

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Software Engineering □ Grade and GPA requirements

## Grade and GPA requirements

Students in this degree program must complete 13 courses (52 hours) beyond the Prerequisite Phase. Successful completion of the Software Engineering Program consists of:

- Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.
- Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree.
- Students will not be approved for graduation with less than a 2.50 GPA.
- Students with a GPA of 3.9 or higher will graduate with distinction.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Software Engineering □ Prerequisite Phase

## Prerequisite Phase

Prerequisite Phase for **Project Management, Software Development, Software Architecture and System Analysis**

CSC 211 Programming in Java I [Self Placement Test Available!](#)

CSC 212 Programming in Java II

or CSC 224 Java for Programmers [Self Placement Test Available!](#)

or CSC 396 Programming in Java I and II

CSC 373 Computer Systems I

CSC 374 Computer Systems II

CSC 383 Data Structures and Algorithms in Java

Prerequisite Phase for **Gaming and Entertainment Technologies**

GAM 224 Introduction to Game Design  
CSC 211 Programming in Java I  
and CSC 212 Programming in Java II  
or CSC 224 Java for Programmers  
or CSC 396 Programming in Java I and II  
CSC 373 Computer Systems I  
CSC 374 Computer Systems II  
CSC 383 Data Structures and Algorithms in Java  
or CSC 393 Data Structures in C++

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Software Engineering □ Graduate Phase

## Graduate Phase

Students may register for graduate courses only after meeting all Prerequisite Phase requirements. The graduate phase consists of the following components:

Foundation Phase  
Advanced Phase  
Elective Phase  
Software Engineering Studio or Capstone phase

### Foundation Phase - All Concentrations

SE 425 Principles and Practices of Software Engineering  
SE 430 Object Oriented Modeling  
SE 450 Object-Oriented Software Development

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## Advanced Phase

### *Software Development Concentration*

Required

SE 477 Software and Systems Project Management  
SE 431 Model-Driven Software Development  
SE 435 Distributed Systems I

### *Project Management Concentration*

Required

SE 477 Software and Systems Project Management  
SE 468 Software Measurement/Project Estimation  
SE 470 Software Development Processes

### *Software Architecture Concentration*

Required

SE 477 Software and Systems Project Management  
SE 480 Software Architecture  
SE 435 Distributed Systems I

### *System Analysis Concentration*



Required

SE 477 Software and Systems Project Management  
SE 482 Requirements Engineering  
SE 433 Software Testing

***Gaming and Entertainment Technologies Concentration***

Required

SE 456 Architecture of Computer Games  
HCI 440 Usability Engineering  
GPH 425 Survey of Computer Graphics  
SE 556 Advanced Architecture of Computer Games

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**Elective Phase - *Software Engineering Electives***

Four courses from any of the following:

Software Development

SE 431 Model-Driven Software Development  
SE 480 Software Architecture  
SE 533 Software Validation and Verification  
SE 540 Software Development for Mobile and Wireless Systems  
SE 542 Software Development for Limited and Embedded Devices

Enterprise Computing

SE 452 Object-Oriented Enterprise Computing  
SE 554 Enterprise Component Architecture  
SE 453 Architecture and Frameworks for Developing Client Applications  
SE 457 Service-Oriented Architecture  
SE 560 Structured Document Interchange and Processing

Computer Security

SE 473 Security Architecture I  
SE 573 Security Architecture II  
CNS 450 Computer Forensics

Distributed Systems

SE 435 Distributed Systems I  
SE 536 Distributed Systems II  
SE 552 Concurrent Software Development  
TDC 573 Multimedia Networking  
CSC 438 Framework for Web Application Development

Project Management

SE 468 Software Measurement/Project Estimation  
SE 477 Software and Systems Project Management  
IS 556 Enterprise Project Management  
IS 535 Information Technology Investment Financial Analysis  
IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance  
IS 565 IT Outsourcing  
IS 560 Enterprise Systems

Requirements Engineering

SE 470 Software Development Processes

SE 482 Requirements Engineering  
HCI 440 Usability Engineering  
SE 433 Software Testing

#### User Interface Engineering

HCI 440 Usability Engineering  
SE 453 Architecture and Frameworks for Developing Client Applications  
SE 540 Software Development for Mobile and Wireless Systems  
SE 546 Software Architecture and Design for Desktop Applications

#### Bio-Informatics

CSC 421 Applied Algorithms and Structures  
CSC 531 Introduction to Bioinformatics  
CSC 541 Introduction to Proteomics

#### Programming Languages & Compiler

CSC 447 Concepts of Programming Languages  
CSC 448 Compiler Design  
CSC 548 Advanced Compiler Design  
CSC 535 Formal Semantics of Programming Languages

#### System Engineering

SE 540 Software Development for Mobile and Wireless Systems  
SE 542 Software Development for Limited and Embedded Devices  
SE 546 Software Architecture and Design for Desktop Applications  
CSC 443 Introduction to Operating Systems  
CSC 546 Operating Systems Design  
CSC 559 Software Project: Developing Financial Engines

#### Gaming and Entertainment Technology

SE 456 Architecture of Computer Games  
SE 556 Advanced Architecture of Computer Games  
SE 558 Architecture and Design for Multiplayer Games  
GAM 476 Artificial Intelligence for Computer Games  
GPH 425 Survey of Computer Graphics

#### Artificial Intelligence

CSC 480 Foundations of Artificial Intelligence  
CSC 578 Neural Networks and Machine Learning

#### **Software Engineering Research**

Students taking the research option must take the following course:

SE 690 Research Seminar

Student must also complete one of the following:

SE 696 Master's Project  
SE 698 Master's Thesis

SE 698 Masters Thesis is a two-credit hour course. Students must register for this course a minimum of two times and must continue to enroll in the course in every quarter after the first quarter until the thesis is completed to the satisfaction of their advisor. A maximum of four credit hours will apply for degree credit.

The Master's project or thesis must represent an original contribution to the area, and may include system development, empirical studies, or theoretical work. The scope and the details of the research project will be determined by the research supervisor, and must be approved by the student's academic advisor.

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## **Elective Phase CTI Electives**

One elective course in the range of 420-699, must be from the school of CTI. Credit for courses taken outside of the school will only be given if approved by a faculty advisor. Courses suggested for any Prerequisite Phase in any concentration do not count for elective credit. Any course required for the student's concentration but taken as part of the requirements of another degree earned by the student may be waived, but cannot be used for elective credit.

## **Elective Course Restrictions**

Elective courses are in the range of 420-699, and must be from the school of CTI. Credit for courses taken outside of the school will only be given if approved by a faculty advisor. Courses suggested for any Prerequisite Phase in any concentration do not count for elective credit. Any course required for the student's concentration but taken as part of the requirements of another degree earned by the student may be waived, but cannot be used for elective credit.

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## **Software Engineering Studio or Capstone Phase**

Students in all concentrations are required to complete the following:

Students in the **Software Development, Project Management, Software Architecture and Systems Analysis** concentrations are required to complete the following:

SE 491 Software Engineering Studio  
SE 591 Software Engineering Studio II

These two courses must be taken as a sequence in consecutive quarters. Students will be working on a large, real project in a team. The project will be carried out from conceptualization to completion using the current technologies.

Students in the Gaming and Entertainment Technology concentration are required to complete

**One of the following :**

GAM 594 Gaming and Entertainment Technology Capstone  
SE 491 Software Engineering Studio

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Software Engineering □ Grade and GPA Requirements

## **Grade and GPA Requirements**

Students in this degree program must complete 13 courses (52 hours) beyond the Prerequisite Phase. Successful completion of the Software Engineering Program consists of:

- Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.
- Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree.
- Students will not be approved for graduation with less than a 2.50 GPA.
- Students with a GPA of 3.9 or higher will graduate with distinction.

# Master of Science in Telecommunications Systems

School of Computer Science, Telecommunications & Information Systems - Graduate Studies ▢ Doctorates and Masters ▢ Master of Science in Telecommunications Systems

## About

Nearly every industry depends on networks. The degree in Telecommunications Systems trains professionals who meet current industry demands for innovative network designs, and the development of new network applications and services for business enterprises and the network providers that serve them.

**The Master of Science in Telecommunications Systems** offers theoretical and applied study of the design, configuration and management of converged communication networks. Students completing this degree program have a thorough understanding of the technical and operational aspects of networks as well as the foundational theory of voice/data communications and network management.

After completing a common set of foundation courses, students can specialize in a variety of technical areas including network protocols, analysis, management, and security on both wired and wireless network infrastructures.

Through a combined emphasis on both theory and hands-on laboratory experiences, students gain expertise in a variety of specialized networking technologies, including the Internet, private network, and local area network arenas. Students can gain experience with network devices and servers in lab facilities focused on enterprise network, security, and multimedia network services.

## What Students Learn From The Program

- A solid foundation in network design and operations
- A thorough understanding of security issues on both wired and wireless networks
- A comparative analysis of current carrier network service offerings, with an understanding of the service level vs. pricing tradeoffs inherent in each service.
- A detailed understanding of the function, operations and management of network infrastructure components, including routers, switches, access points, and servers.
- A strategic view of future networking trends in the Internet, wireless, security and local network services arenas.

## Program Information

The program follows a three-phase sequence, with each phase preparing the student for the subsequent phase. The masters degree program consists of:

### Prerequisite Phase

### Foundation Phase

### Advanced Phase

Upon acceptance into the master's degree program, the student will meet with their faculty advisor to discuss required courses for the Prerequisite Phase. The Prerequisite Phase is intended to ensure that all students enter graduate courses with an equivalent background. While completing this phase, a student is considered a conditionally admitted master's student. In the Foundation phase, a student will follow a sequence of courses to acquire an understanding of the technological and theoretical foundations for the particular degree. In the Advanced Phase of the program, the fundamental information learned previously allows a student to study advanced topics within their chosen degree. This phase adds depth to the work completed in the Foundation Phase. Individual interests and needs are also addressed through a series of elective courses chosen in consultation with the student's faculty advisor.

Grade and GPA Requirements

Prerequisite Phase

Foundation Phase

Advanced Phase

## Elective Course Restrictions

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Telecommunications Systems □ Grade and GPA Requirements

### Grade and GPA Requirements

**Grades** : Students must receive a grade of B- or better in each Prerequisite and Foundation Phase course and a C- or better in all other courses..

**GPA** : Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.90 will graduate with distinction.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Telecommunications Systems □ Prerequisite Phase

### Prerequisite Phase

CSC 211 Programming in Java I [Self Placement Test Available!](#)

or CSC 261 Programming Languages I: C/C++

or any more advanced programming course

IT 223 Data Analysis [Self Placement Test Available!](#)

TDC 311 Computers in Telecommunications Systems

or CSC 373 Computer Systems I

TDC 361 Basic Communication Systems

By taking these courses and receiving a grade of a B- or better in each, the student will have completed the requirements of the Prerequisite Phase. All or part of the Prerequisite Phase may be waived if a student has the equivalent academic background. Alternatively, students with practical experience may complete a Graduate Assessment Examination (GAE) to show competency in a prerequisite. All students are blocked from enrolling in Foundation Phase courses prior to completing their prerequisites. The student must submit an online Change of Status request when the Prerequisite Phase is completed to inform the Student Services offices that the block can be removed. The online request must be submitted two weeks before the student intends to register for graduate level classes. The student will then be considered a fully admitted student, and may pass to the Graduate Phase of the program. Students may submit the Change of Status request by logging in to MyCTI.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Telecommunications Systems □ Foundation Phase

### Foundation Phase

Fully admitted students in the Foundation phase may register for a maximum of four Advanced phase courses. The Foundation Phase courses for the MS in Telecommunications are:

TDC 460 Foundations of Communications Systems  
TDC 463 Computer Networks and Data Systems  
TDC 464 Voice Communication Networks

By taking these courses and receiving a grade of a B- or better in each, the student will have completed the requirements of the Foundation Phase. If a student receives a grade below B- but better than or equal to C- for a Foundation Phase course, the student is given an option to take a course-specific core competency exam to pass the failed course. If the student fails the exam, the student must retake the failed course. The student can take an exam only once for each failed course. There is no other core examination in the Foundation Phase.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Telecommunications Systems □ Advanced Phase

## Advanced Phase

A student must complete 40 credits (10 courses) in the Advanced Phase to earn the MS in Telecommunication Systems. All courses in the Advanced Phase must be completed with a grade of C- or better.

TDC 511 Telecommunications Practicum  
TDC 567 Telecommunication Systems Design and Management

- **Five TDC courses** from the range TDC 430 to TDC 599, where at least *three are numbered* above 500.
- Students must also complete **three open electives**.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Telecommunications Systems □ Elective Course Restrictions

## Elective Course Restrictions

Elective courses are in the range of 420-699 (excluding TDC 425) and must be from the school of CTI. Credit for courses taken outside of the school will only be given if approved by a faculty advisor. Courses suggested for any Prerequisite Phase in any concentration do not count for elective credit. Any course required for the students concentration but taken as part of the requirements of another degree earned by the student may be waived, but cannot be used for elective credit.

## Advanced Software Development Professional

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Advanced Software Development Professional

### About

After completing a Master's Degree, or gaining software engineering certification, a student may decide to continue their education as a software development professional. They might come back to gain new technical skills, take advanced classes which did not fit into their degree plan, or to help with professional recertification. The IEEE Computer Society Certified Software Development Professional program requires continual recertification, which may include College and

University Courses. As part of DePaul University's commitment to life-long-learning, CTI is pleased to offer students with a Master's degree or IEEE professional certification an opportunity to enroll for advanced classes.

The program is an open-ended series of courses, which does not lead to a degree. To qualify for the Advanced Software Development Professional program, a student must either:

- Have a Master's Degree in Computer Science, Software Engineering, or another technical, scientific or engineering field, or
- Be certified by the IEEE Computer Society Certified Software Development (CDSPŽ) program.

Upon acceptance into the program, the student will meet with their faculty advisor to discuss which classes they would like to take.

After meeting with their faculty advisor, the student will have Non-Degree-Seeking status, and will be able to take any CTI class, as long as they satisfy the prerequisites for that class. If they do not have a Master's degree from DePaul University, they should discuss with their faculty advisor which classes they may have to take to satisfy these prerequisite requirements.

Courses taken as part of the Advanced Software Development Professional program may be used towards recertification for the IEEE Computer Society Certified Software Development Professional program. To be recertified, a candidate must first gain CDSP certification, and must then earn 30 Professional Development Units, 15 of which may come from College and University courses. Since each CTI course is worth 5.2 PDUs, three CTI courses will earn those 15 PDUs. CDSP recertification is required every three years, and so one CTI course per year will count for half of a candidate's recertification requirements.

A student in the Advanced Software Development Professional program who later is accepted to a degree program at DePaul University may count up to three courses taken in this program towards the degree.

Students are free to take any CTI classes they satisfy the prerequisite requirements for. The following classes may be of particular interest to software professionals:

SE 480 Software Architecture  
SE 469 Software Safety  
SE 470 Software Development Processes  
SE 472 Personal Software Process  
SE 473 Security Architecture I  
SE 477 Software and Systems Project Management  
SE 480 Software Architecture  
SE 482 Requirements Engineering  
SE 529 Software Risk Management  
SE 531 Formal Software Specifications and Development II  
SE 533 Software Validation and Verification  
SE 540 Software Development for Mobile and Wireless Systems  
SE 542 Software Development for Limited and Embedded Devices  
SE 546 Software Architecture and Design for Desktop Applications  
SE 550 Distributed Software Development  
SE 552 Concurrent Software Development  
SE 554 Enterprise Component Architecture  
SE 558 Software Methodologies  
SE 560 Structured Document Interchange and Processing  
SE 567 Software Reliability  
SE 571 Software Maintenance  
SE 573 Security Architecture II  
SE 580 Design of Object-Oriented Languages  
SE 590 Advanced Topics in Object Oriented Technology

*DePaul University's Software Engineering Program is an IEEE Computer Society registered Education Provider. DePaul University's Software Engineering Program is committed to enhancing the ongoing professional development of software development professionals, Certified Software Development Professionals (CSDPŽ), and other software stakeholders through appropriate software engineering learning activities and products. As a CSDP Education Provider, DePaul University's Software Engineering Program has agreed to abide by IEEE Computer Society established operational and educational criteria, and is subject to random audits for quality assurance purposes.*

*Advice given by DePaul University faculty and staff about CDSP recertification is for informational purposes only. This*

*document may not reflect the most recent requirements for CDSP recertification.*



# Graduate Assistantships

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Graduate Assistantships

## **Graduate Assistantships**

Announcement of Graduate Assistantships is generally made by June 1. Assistantships must be accepted or declined, in writing, by July 1. Recipients will be assigned by their program directors or departments to activities appropriate for a teaching, research or administrative assistant.

# The Vincentian Character of DePaul University

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ The Vincentian Character of DePaul University

## **The Vincentian Character of DePaul University**

DePaul, a Catholic university, takes its name from St. Vincent DePaul. The religious community founded by Vincent, commonly known as Vincentians, opened the university and endowed it with a distinctive spirit: to foster in higher education a deep respect for the God-given dignity of all persons, especially the materially, culturally, and spiritually deprived; to instill in educated persons a dedication to the service of others. In each succeeding generation the women and men of DePaul have pursued learning in this spirit of Vincent DePaul.