

DEPAUL
UNIVERSITY



Course Catalog

School of Computer Science Telecommunications

Summer/Autumn 2007-2008

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General Information

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

Deans

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GREGORY BREWSTER, PH.D.
Associate Dean
MARTIN KALIN, PH.D.
Associate Dean
LINDA V. KNIGHT, PH.D.
Associate Dean

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
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.

Faculty

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Purposes

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.

Facilities

DePauls Information System Division (ISD) houses a large network of computers and allows students, access to a rich computing environment. The configuration includes several Sun SPARCcenters for student use. In addition, students have access to IBM PC laboratories and Macintosh laboratories at the Loop and Lincoln Park campuses. There are numerous dial-up phone numbers available for off-campus work. DePauls suburban campuses, in the Naperville, OHare and South areas also offer excellent student laboratory facilities. Permanent student Internet access accounts are available along with dial-in SLIP connections.

- The School itself operates specialized laboratories in the following:

American Sign Language (ASL) Lab
Animation Lab
Applied Requirements Engineering Lab
Artificial Intelligence (AI) Research Lab
Center for Applied Computer Science (CACS)
Center for Web Intelligence
Critical Systems Lab
CTI Video Lab
Database Lab
Digital Video Editing Lab
E-Commerce Technology (ECT) Lab I & II Gaming Lab
Local Area Networks (LAN) Lab
Millennium Boardroom
Mobile E-Commerce Research Lab
Multimedia Networking Research Lab
PhD Office
Software Engineering Research Lab
Software Exploration Lab
Solid Objects Lab
Telecommunications Lab
The Digital Cinema Center
Usability Lab

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 full-time faculty with consulting experience 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 370 Advanced SQL Program

A 2-week program covering advanced SQL features

IPD 371 Advanced Oracle PL/SQL Program

A 3-week program covering advanced PL/SQL concepts and programming constructs

IPD 381 Best Practices in Web Design Program

A 7-week comprehensive program covering best practices in web design based on current mark-up, presentation, and accessibility standards

IPD 395 Database Technologies Program

A 12-week comprehensive program covering database applications development and administration using Oracle

IPD 380 Information Systems 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 J2EE Developer Program

A 10-week in-depth program covering enterprise-wide applications development using J2EE

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 393 Local Area Networks Program

A 12-week intensive program in the fundamentals of wired and wireless local area networks, wide area networks, and network-based services

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 396 Network Security Program

An 11-week intensive program in the fundamentals of network security, hosts security, and Information Assurance

IPD 376 Oracle Database Availability, Scalability, and Recoverability Program

A 3-week program covering Oracle database availability, scalability, and recoverability

IPD 372 Oracle Database Programming Using Open Architecture Program

A 3-week program covering open architecture database application development

IPD 367 Understanding Wireless Mobility & Security Program

A 10-week rapidly-paced overview and exploration of the major concepts and key issues driving the wireless mobility revolution in business, industry, law, government, healthcare, transportation and education

IPD 392 Voice-over-IP Program

A 12-week integrated program focusing on designing and implementing fully converged and integrated Voice-over-IP (VoIP) networks and systems

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.

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 ore 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

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 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.

MFA Application Process

MFA Committee

MFA Committee

The MFA Thesis

The MFA Thesis

The Thesis Screening

The Thesis Screening

The MFA Thesis Defense

Required Courses for the MFA in Digital Cinema

Time Limit

Required Courses for the MFA in Digital Cinema

Time Limit

Master of Arts in Information Technology

About

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

This program may be appropriate for individuals in sales, management, marketing, journalism, law, or other professions who need to interact closely with IT specialists and technicians without being an IT specialist or technician. The program also is suited for managers of IT staff. For example, a large telecommunications company may have a non-technical sales manager for a technical sales force whose customers are also technically oriented. The goal of the MA in Information Technology program is to prepare someone like the non-technical sales manager to interact effectively with the technical sales force and the technical customers

Students who complete this program will acquire an understanding of and experience with:

The concepts, tools, and practices of information technology management (IS 425)

The analysis phase of the software development life cycle (HCI 445).

The fundamentals of networks for voice and data communications and for the integration of voice and data streams (TDC 460).

The methods and problems associated with technology-triggered business transformation (IS 450).

The basics of database design. (CSC451)

The fundamentals of project management for software systems (IS 556 or SE 447).

The skills to acquire and analyze data (HCI 445 and CSC 423).

Prerequisite Phase

Foundation Phase

Advanced Phase

Culminating Thesis

Phase Descriptions

Phase Descriptions

Prerequisite Phase

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

IT 130 The Internet and the Web

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.

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.

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 and a designation of *distinction* on the core examinations will graduate with distinction.

Foundation Phase

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

CSC 423 Data Analysis and Regression

CSC 451 Database Design

ECT 455 E-Commerce Web Site Engineering

HCI 440 Usability Engineering

HCI 445 Inquiry Methods and Use Analysis

IS 511 Social Issues of Computing

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 498 Topics in Global Information Technology

IS 425 Enterprise Information

IS 450 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 572 Information Security Management
IS 577 Information Systems Capstone
IS 578 Information Technology Consulting
IS 596 Topics in Information Systems
ITS 560 Information Technology 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

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 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.](#)

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; and
- ~ 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.

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

This program may be appropriate for individuals in sales, management, marketing, journalism, law, or other professions who need to interact closely with IT specialists and technicians without being an IT specialist or technician. The program also is suited for managers of IT staff. For example, a large telecommunications company may have a non-technical sales manager for a technical sales force whose customers are also technically oriented. The goal of the MA in Information Technology program is to prepare someone like the non-technical sales manager to interact effectively with the technical sales force and the technical customers

Students who complete this program will acquire an understanding of and experience with:

- The concepts, tools, and practices of information technology management (IS 425)
- The analysis phase of the software development life cycle (HCI 445).
- The fundamentals of networks for voice and data communications and for the integration of voice and data streams (TDC 460).
- The methods and problems associated with technology-triggered business transformation (IS 450).
- The basics of database design. (CSC451)
- The fundamentals of project management for software systems (IS 556 or SE 447).
- The skills to acquire and analyze data (HCI 445 and CSC 423).

Prerequisite Phase
Foundation Phase
Advanced Phase
Culminating Thesis

Prerequisite Phase

Grade and GPA Requirements

Foundation Phase

Advanced Phase

Culminating Thesis

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master of Science in Applied 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
 IT 223 Data Analysis

IT 230 Building Internet Applications
TDC 361 Basic Communication Systems

By taking these courses and receiving a grade of 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 [MyCTL](#).

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

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 and a designation of *distinction* on the core examinations will graduate with distinction

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

Foundation Phase

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

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

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

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 498 Topics in Global Information Technology
IS 425 Enterprise Information
IS 450 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 572 Information Security Management
IS 577 Information Systems Capstone
IS 578 Information Technology Consulting
IS 596 Topics in Information Systems
ITS 560 Information Technology 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 Science in Applied 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 Business Information Technology

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

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 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

Or to apply online:
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

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 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.

Admissions

Prerequisites Course

Required Courses

Grad and GPA Requirements

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

Admissions

Your Application: Accepted throughout the Year

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 Promath Calculus for Mathematics and Science Majors I and
MAT 171 Promath Calculus for Mathematics and Science Majors II

Courses (2) from the School of CTI
AND

CSC261 Programming Languages I: C/C++ and
CSC 262 Programming Languages II: C/C++ OR
CSC 309 Object-Oriented Programming

AND

CSC 393 Data Structures in C++

AND

CSC 202 Mathematics for Computer Science OR CSC 321 Design and Analysis of Algorithms

Required Courses

Courses (7) from the Kellstadt Graduate School of Business Offered Fall

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
FIN662 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 485 Numerical Analysis
CSC 521 Monte Carlo Simulations: Algorithms and Applications
CSC 696 Master's Project or CSC 697 Graduate Internship
One elective chosen from any 500 level course in the School of CTI.

Grad 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 Graphics and Animation

About

The M.S. in Computer Graphics and Animation 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. Several fundamental principles provide the basis for this curriculum:

- ∨ Computer graphics professionals, no matter their area of specialty, will need a solid grounding in both perception and technology.
- ∨ To be successful in the workplace, computer graphics professionals will need to be able to work well in multidisciplinary environments.
- ∨ To inculcate the flexibility required to adapt to rapid changes in technology and industry norms, students will need to be well versed in the foundations of the discipline.
- ∨ Practical experience must be coupled with theory to prepare students for the workplace.

The degree has five components:

- ∨ **Prerequisite Phase**
- ∨ **Fundamental Phase**
- ∨ **Core Phase**
- ∨ **Advanced Phase**
- ∨ **Electives**

In this program, students will:

- ∨ 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; and
- ∨ Become appreciative of the two cultures of computer graphics the one drawing on communication design and the other deriving from computer science.
- ∨ 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.

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.

The M.S. in Computer Graphics 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

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

Prerequisite Phase

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

Both concentrations

HCI 402 Foundations of Digital Design
GPH 212 Perceptual Principles for Digital Environments II
IT 240 Introduction to Desktop Databases

Technical Director concentration *

CSC 211 Programming in Java I
CSC 212 Programming in Java II
or CSC 224 Java for Programmers
or CSC 396 Programming in Java I and II
GPH 259 Design Geometry

The CGA developer Track.

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 Animation □ Fundamental Phase

Fundamental Phase

The courses in the Fundamental Phase for the MS in Computer Graphics and Animation 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 Animation □ Core Phase

Core Phase

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

Technical Directors concentration

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

Developers concentration

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

Advanced Phase

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

Both concentrations

GPH 539 Advanced Rendering Techniques

Technical Directors concentration

GPH 565 Designing for Visualization

Developers concentration,
GPH 570 Visualization

Elective Courses

Students in this program will have 4 electives to be chosen from the following list

ANI 430 3D Character Animation
ANI 450 Motion Capture Workshop
GPH 540 Procedural Shading
GPH 541 Advanced Lighting Techniques
GPH 538 Rigging for Animation
GPH 436 Fundamentals of Computer Graphics
GPH 450 Digital Modeling I
GPH 469 Computer Graphics Development
GPH 536 Smooth Surface Modeling for Graphics and Animation
GPH 560 Modeling Spaces
GPH 572 Principles of Computer Animation
GPH 574 Computer Games
GPH 575 Advanced Graphics Development
GPH 576 Artificial Intelligence in Computer Games
GPH 595 Topics in Graphics
HCI 422 Multimedia
HCI 423 Internet Multimedia
HCI 440 Usability Engineering
HCI 450 Foundations of Human-Computer Interaction
HCI 460 Usability Evaluation Methods HCI 471 Digital Page Formatting II

Master of Science in Computer, Information and Network Security

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

About

The Master of Science in Computer, Information and Network Security is intended for those students who wish to specialize in the security aspects of the Information Technology (IT) field. It is suited for students who wish to pursue work in a security related 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 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; and
- ∨ Be lifelong learners in the information security environment.

Students must complete the requirements of one of the three concentrations: Computer Security, Information System Security, or Network Security.

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 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

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!
and CSC 212 Programming in Java II
or CSC 224 Java for Programmers
or CSC 396 Programming in Java I and II
CSC 309 Object-Oriented Programming in C++
or CSC 261 Programming Languages I: C/C++
and CSC 262 Programming Languages II: C/C++
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
CSC 212 Programming in Java II
or CSC 224 Java for Programmers
or CSC 396 Programming in Java I and II
IT 223 Data Analysis
IT 215 Analysis and Design Techniques
ECT 310 Internet Application Development
TDC 361 Basic Communication Systems

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!
CSC 202 Mathematics for Computer Science
Or MAT 140 Discrete Mathematics I
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 Computer, Information and Network Security □ Foundation Phase

Foundation Phase

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

SE435 Foundations of 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 **Network Security Concentration** :

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

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

TDC 477 Network Security I
IS 511 Social Issues of Computing
or CNS 477 Legal Issues in Information Assurance
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:

1) Complete the following 2 courses:

CSC 440 Cryptology
SE 473 Security Architecture I

2) Complete one (1) of the following two (2) courses:

SE 547 Foundations of Computer Security
SE 573 Security Architecture II

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

SE 535 Foundations of Distributed Systems II
SE 482 Requirements Engineering
SE 529 Software Risk Management
SE 547 Foundations of Computer Security
SE 573 Security Architecture II
TDC 577 Network Security II

Information Systems Security Concentration :

A student must complete the following course:

IS 533: Enterprise Security Infrastructure Controls and Regulatory Compliance

Complete four (3) of the following courses:

CNS 477 Legal Issues in Information Assurance (This course can not be counted in this category if used for foundation phase fulfillment)
ECT 582 Secure Electronic Commerce
ECT 585 Legal Aspects of E-Commerce
IS 483 Information Services and Operations
IS 505 Business Continuity and Disaster Recovery
IS 511 Social Issues of Computing (This course can not be counted in this category if used for foundation phase fulfillment)
IS 540 Global Information Technology
SE 430 Object Oriented Modeling
SE 482 Requirements Engineering
SE 529 Software Risk Management
TDC 577 Network Security II

Network Security Concentration :

1) Complete the following 3 courses:

TDC 511 Telecommunications Practicum

TDC 563 Protocols and Techniques for Data Networks

TDC 577 Network Security II

2) Complete two (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 **CINS Elective** Student must complete 1 additional 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 requirement. **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. **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, ECT 698, IS 698, SE 698, TDC 698 Masters Thesis

Master of Science in Computer Science

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

About

The Master of Science in Computer Science is the most technical of CTI's masters programs. The courses in the Prerequisite Phase and Core Knowledge Phase focus on the foundations and fundamentals of programming languages, and the theoretical underpinnings of computer science. As part of the Advanced Phase, students get a breadth of training in traditional areas of computer science by taking one course each in Foundations, Computer Systems, and Database Systems. The remainder 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 from one of the other degree programs in CTI. Or, they may achieve a breadth of knowledge across many areas by selecting courses from a variety of areas. This degree is appropriate for students who wish to pursue a technical 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.

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

- ~ Prerequisite Phase
- ~ Core Knowledge 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 student's faculty advisor.

Grade and GPA requirements

Prerequisite Phase

Core Knowledge Phase

Advanced Phase

Masters Research Option

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 for the MS in Computer Science are:

CSC 202 Mathematics for Computer Science
CSC 211 Programming in Java I
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

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.

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

Core Knowledge Phase

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 Computer Science are:

CSC 447 Concepts of Programming Languages

CSC 491 Design and Analysis of Algorithms SE 450 Object-Oriented Software Development Methods

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

Advanced Phase

One course in each of the following areas: Foundations , Computer Systems , Database Systems
Four additional courses from the areas above or Artificial Intelligence , Computer Vision , Data Analysis , Computer Graphics , Software Engineering , Security , Network Technologies , two of which must be 500-level . Courses are grouped into different areas below for your convenience. A student may concentrate in one area by taking all 4 courses from the same area, or may wish to take courses from a variety of areas.

Three elective courses . Students must choose three graduate level elective courses from the School of CTI . Elective courses are in the range of 420-699.

Overall, at least four 500-level courses.

There is a research option for this degree as well.

Database Systems Area

CSC 449 Database Technologies

CSC 451 Database Design

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 575 Intelligent Information Retrieval

CSC 589 Topics in Database

Foundations Area

CSC 444 Automata Theory and Formal Grammars

CSC 448 Compiler Design

CSC 503 Parallel Algorithms

CSC 504 Parallel Processing

CSC 531 Introduction to Bioinformatics

CSC 535 Formal Semantics of Programming Languages

CSC 544 Theory of Computation

CSC 547 Advanced Topics in Program Languages

CSC 548 Advanced Compiler Design

SE 580 Design of Object-Oriented Languages

SE 590 Advanced Topics in Object Oriented Technology

Computer Systems Area

CSC443 Operating Systems

CSC 545 Advanced Computer Organization

CSC 546 Operating Systems Design

SE435 Foundations of Distributed Systems I

SE536 Foundations of Distributed Systems II

DS 513 Client/Server Technologies

SE 540 Software Development for Mobile and Wireless Systems

SE 542 Software Development for Limited and Embedded Devices

SE 550 Distributed Software Development

SE 552 Concurrent Software Development

TDC 561 Network Programming

Artificial Intelligence Area

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 575 Intelligent Information Retrieval

CSC 594 Topics in Artificial Intelligence

Bioinformatics Area

CSC 532 Introduction to Bioinformatics

CSC 541 Introduction to Proteomics

CSC 542 Research Practicum in Computational Biology

Computer Vision Area

CSC 481 Introduction to Image Processing

CSC 498 Digital Signal Processing

CSC 538 Vision Systems

CSC 581 Applied Image Analysis

CSC 584 Computer Vision

CSC 592 Topics in Computer Vision and Pattern Recognition

Data Analysis Area

CSC 423 Data Analysis and Regression

CSC 424 Advanced Data Analysis

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

Computer Graphics Area

GPH 436 Fundamentals of Computer Graphics

GPH 438 Computer Animation Survey

GPH 448 Computer Graphics Scripting

GPH 469 Computer Graphics Development

GPH 470 Survey of Computer Graphics

GPH 536 Smooth Surface Modeling for Graphics and Animation

GPH 539 Advanced Rendering Techniques

GPH 560 Modeling Spaces

GPH 570 Visualization

GPH 572 Principles of Computer Animation

GPH 574 Computer Games

GPH 575 Advanced Graphics Development

GPH 595 Topics in Graphics

Software Engineering Area

SE 427 Software Quality Management

SE 430 Object Oriented Modeling

SE 431 Formal Software Specification and Development I

SE 433 Software Testing

SE 452 Object-Oriented Enterprise Computing

SE 465 Software Engineering Principles

SE 468 Software Measurement/Project Estimation

SE 469 Software Safety

SE 470 Software Development Processes

SE 472 Personal Software Process

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 546 Software Architecture and Design for Desktop Applications

SE 554 Enterprise Component Architecture

SE 558 Software Methodologies

SE 560 Structured Document Interchange and Processing

SE 571 Software Maintenance

Security Area

CSC 440 Cryptology

SE 435 Foundations of Distributed Systems I

SE 536 Foundations of Distributed Systems II

ECT 582 Secure Electronic Commerce

IS 511 Social Issues of Computing

IS 572 Information Security Management

SE 473 Security Architecture I

SE 547 Foundations of Computer Security

SE 573 Security Architecture II
TDC 511 Telecommunications Practicum
TDC 562 Computer-Communication Network Design and Analysis
TDC 563 Protocols and Techniques for Data Networks
TDC 572 Network Security
Network Technologies Area
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 489 Queuing Theory with Computer Application
TDC 511 Telecommunications Practicum
TDC 512 Cellular and Wireless Telecommunications
TDC 513 Client/Server Technologies
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 Integrated Services Digital Networks
TDC 568 Network Management
TDC 572 Network Security
TDC 573 Multimedia Networking

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

Masters Research Option

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 a research project. This option can be satisfied by taking the course CSC 696 (Masters Project) at least twice, each time for 4 credits. The Masters research option will replace one elective and one of the 4 required area courses. Students who choose this option must successfully complete the core exams prior to their first enrollment in CSC 696. The research project 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. At the end of the two quarters, 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 Technical Report.

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 degree in Digital Cinema follows the tradition in the School of Computer Science, Telecommunications, and Information Systems (hereafter, CTI) of developing innovative programs designed to fill curricular needs. Nowhere is that need more prevalent than in the area of Digital Cinema. The program 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.

Today, virtually all theatrically released films are edited on computers. More and more Hollywood films are shot using high-definition digital cameras. Filmmakers including George Lucas, James Cameron, and Robert Rodriguez have made movies without ever touching a piece of 35mm film. Theaters are now showing movies using digital video projectors. The number increases every year. The future belongs to Digital Cinema.

No U.S. university offers a MS degree in Digital Cinema. Many offer MA and/or MFA degrees in the traditional areas of cinema production and studies, firmly rooted in traditional film production techniques and aesthetics. Digital Cinema at CTI is dedicated to utilizing the latest cutting edge digital technology while incorporating classic cinema narrative theory and aesthetics. The program seeks to define and to develop the relationship between changing technologies and creative artistic expression. The program follows a three-phase sequence, with each phase preparing the student for the subsequent phase. The master's degree program consists of:

Prerequisite Phase
Core Knowledge 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 student's faculty advisor. **GPA requirements** Grade Point Average Requirements A grade point average of at least 3.0 (A = 4.0) must be maintained in all course work toward the masters degree. Courses in which a grade of C- (1.7) or lower is earned will not apply toward a graduate degree.

Phase Descriptions

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

Phase Descriptions

Prerequisite Phase

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

DC 201 Narrative Techniques in Digital Cinema
DC 210 Digital Cinema Production I
DC 220 Non-Linear 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 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: The core knowledge phase is designed to provide a common foundation in digital cinema production.

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 412 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 High-Definition 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 Producing the Feature Film 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.

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. Modern organizations are designing and deploying Internet-based technologies for integrated e-commerce transactions, supply chain management, customer relationship management, and enterprise portals. The movement toward e-business collaboration among organizations along industry value chains will demand IT professionals to develop strong technical skills as well as a deep knowledge of IT architecture and business processes. The MS in E-Commerce Technology exposes students to a broad and ever-changing mix of technologies, programming languages and tools. Practicum, team projects, and work for real clients provide an authentic environment for learning. The new 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, or design of information security, networks, and databases.

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 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
CSC 212 Programming in Java II
or CSC 224 Java for Programmers
or CSC 396 Programming in Java I and II
CSC 383 Data Structures and Algorithms in Java

ECT 310 Internet Application Development
SE 325 Principles and Practices of Software Engineering

*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

CSC 449 Database Technologies
ECT 425 Technical Fundamentals of Distributed Information Systems
ECT 455 E-Commerce Web Site Engineering 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

(8 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 a customized module, and
- b) Additional elective courses.

Capstone (1 course)

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

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

IT Management Oriented [mn]

- mn1. IT Project Management I

IS 483 Information Services and Operations
IS 512 Groupware and Virtual Collaboration
IS 535 IT 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 Behavior in Organizations (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 Security Management & 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 IT 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 Mgt. (Kellstadt Graduate School of Business)

mn4. Legal & Social Issues

ECT 585 Legal Aspects of E-Commerce
IS 433 Information Security Management (formerly IS 572)
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 (formerly IS 572)
IS 505 Business Continuity and Disaster Recovery
IS 533 Security Management & Compliance
IS 535 IT Investment Financial Analysis
IS 556 Enterprise Project Management
IS 560 Enterprise Systems

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

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 IT 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 Mgt. (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 IT Investment Financial Analysis
IS 549 Data Warehousing and Data Mining
IS 556 Enterprise Project Management
IS 560 Enterprise Systems
MGT 501 Strategic Supply Chain Mgt. (Kellstadt Graduate School of Business)

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 GIS
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

Infrastructure Oriented [if]

if1. Network Design

ECT 557 Peer-To-Peer Technology
ECT 587 Mobile Commerce Technology
TDC 460 Foundations of Communication 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 (formerly IS 572)
IS 505 Business Continuity and Disaster Recovery
IS 511 Social Issues of Computing
IS 533 Security Management & 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 IT 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

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.

Human-Computer Interaction (HCI) masters degree

About

The Human-Computer Interaction (HCI) masters degree program focuses on the rapidly growing discipline called Human-Computer Interaction. HCI practitioners are involved in the design, implementation, and evaluation of computer interfaces that are accessible and easy for people to use. This degree integrates courses in computer science, graphic design, psychology, and Human-Computer Interaction to provide a broad understanding of the discipline.

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 take a real-life problem from design through implementation and usability testing.

Grade and GPA requirements

Prerequisite Courses

Fundamentals Courses

Core Courses

Advanced Phase Courses

HCI and Non-HCI

Advanced phase courses open to students who have taken CSC 212

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.

Prerequisite Courses

The courses in the Prerequisite Phase for the MS in Human-Computer Interaction are listed below. Students who intend to take implementation courses at the graduate level are encouraged to take CSC 212 and the graduate-level database course (CSC 449).

IT 130 The Internet and the Web
IT 223 Data Analysis
CSC 211 Programming in Java I
*CSC 212 Programming in Java II
or IT 240 Introduction to Desktop Databases
IT 236 User Interface Development
HCI 402 Foundations of Digital Design

*In place of CSC 211 and CSC 212, students may take CSC 396. CSC 224 is also a substitute for CSC 211 and 212 if students have prior programming experience.

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 [MyCTL](#).

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 Introduction to Human-Computer Interaction
HCI 450 Foundations of Human-Computer Interaction
HCI 470 Digital Page Formatting I

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Human-Computer Interaction (HCI) masters degree □ Core Courses

Core Courses

Students must complete all Prerequisite courses and should complete all Fundamental courses before taking Core courses. The Core courses are:

HCI 430 Prototyping and Implementation
HCI 445 Analysis and Design for Hci
HCI 460 Usability Evaluation Methods
HCI 471 Digital Page Formatting II

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Human-Computer Interaction (HCI) masters degree □ Advanced Phase Courses

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.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Human-Computer Interaction (HCI) masters degree □ HCI and Non-HCI

HCI and Non-HCI

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 450 Enterprise System Implementation.
IS 456 Knowledge Management Systems
IS 511 Social Issues of Computing
IS 512 Groupware and Virtual Collaboration
ITS 427 Information Processing Models of Learning
ITS 431 Instructional Delivery and Course Management Systems
ITS 560 Information Technology 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

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Human-Computer Interaction (HCI) masters degree □ Advanced phase courses open to students who have taken CSC 212

Advanced phase courses open to students who have taken CSC 212

GPH 425 Survey of Computer Graphics

GPH 438 Computer Animation Survey

SE 430 Object Oriented Modeling Capstone Course

HCI 594 Human-Computer Interaction Capstone

Masters Degree Program in Information Systems (IS)

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Masters Degree Program in Information Systems (IS)

About

This MS in Instructional Technology Systems program is intended for graduate students who plan to work with Instructional Technology Systems in two possible capacities:

Students in the Software Design in Instructional Technology Track emerge as accomplished software engineers and programmers. They will be prepared for jobs in software design and construction at Universities and at coding shops that specialize in educational software.

Students in the Systems Integration in Instructional Technology Track emerge as accomplished systems planners, systems analysts, and systems managers. They will be prepared for jobs in instructional software systems management, or as business/systems analysts at coding shops that specialize in educational software.

The MS in Instructional Technology Systems will equip the student with the core theories and skills to advance to be the CIO or CTO of an instruction delivery organization. A primary focus of the degree is to develop practitioners at corporate training and development organizations. The degree is split into two tracks, matching the two capacities listed above.

This program is guided by several curriculum principles:

- ✓ Reflecting the eclectic and developing nature of current Internet and instructional technology

design, this program does not presuppose any dominant technologies or programming languages. Rather, students will be exposed to a broad mix of technologies, programming languages and tools.

- ∨ The program is designed to adapt to rapid changes in both technology and industry norms.
- ∨ The program is designed around industry needs and based upon a long-term partnership with instructional technology leaders.
- ∨ The program is designed to provide maximum opportunities for practicum and team projects.

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**
- **Advanced Phase Courses**
- **Elective Courses**
- **Capstone Course**

Grade and GPA requirements

Prerequisite Phase

Foundation Phase

Advanced Phase

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Masters Degree Program in Information Systems (IS) □ 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 □ Masters Degree Program in Information Systems (IS) □ Prerequisite Phase

Prerequisite Phase

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

Both Tracks

CSC 211 Programming in Java I
CSC 212 Programming in Java II
or CSC 224 Java for Programmers
or CSC 396 Programming in Java I and II
IT 223 Data Analysis

Software Design in Instructional Technology Track

CSC 373 Computer Systems I
CSC 374 Computer Systems II
CSC 383 Data Structures and Algorithms in Java

Systems Integration in Instructional Technology Track

IT 240 Introduction to Desktop Databases
CNS 340 Fundamentals of Information Assurance
IT 215 Analysis and Design Techniques
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 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.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Masters Degree Program in Information Systems (IS) □ Foundation Phase

Foundation Phase

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 Instructional Technology Systems are

Both Tracks

HCI 440 Usability Engineering
HCI 460 Usability Evaluation Methods
ITS 427 Information Processing Models of Learning
ITS 431 Instructional Delivery and Course Management Systems
ITS 560 Instructional Technology Training and User Support

Software Design Track

DS 420 Foundations of Distributed Systems I
SE 450 Object-Oriented Software Development

Systems Integration in Instructional Technology Track

ITS 440 Distance Learning Technologies
HCI 445 Analysis and Design for HCI

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Masters Degree Program in Information Systems (IS) □ Advanced Phase

Advanced Phase

Software Design in Instructional Technology Track

Options: Pick Three from the list below:

CSC 449 Database Technologies
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
DS 421 Foundations of Distributed Systems II
DS 520 System Design and Implementation with Distributed Object Frameworks
DS 575 Intelligent Information Retrieval
ECT 480 Intranets and Portals
HCI 422 Multimedia
HCI 423 Internet Multimedia
ITS 440 Distance Learning Technologies
ITS 584 Artificial Intelligence in Learning Environments
SE 452 Object-Oriented Enterprise Computing
SE 550 Distributed Software Development
TDC 460 Foundations of Communications Systems

Systems Integration in Instructional Technology Track

Options: Pick Three from the list below:

CSC 423 Data Analysis and Regression
CSC 424 Advanced Data Analysis
CSC 428 Data Analysis for Experimenters
ECT 425 Technical Fundamentals of Distributed Information Systems
ECT 433 Survey of Web Programming Technologies
ECT 480 Intranets and Portals
HCI 422 Multimedia
HCI 423 Internet Multimedia
HCI 430 Prototyping and Implementation
HCI 450 Foundations of Human-Computer Interaction
IS 450 Enterprise System Implementation
IS 511 Social Issues of Computing
IS 512 Groupware and Virtual Collaboration
IS 572 Information Security Management

Elective Courses

Both Tracks

Two open electives from CTI courses numbered 420-599

Capstone Course

Required Both Tracks

ITS 589 ITS Capstone Projects Course

Master's Degree in Instructional Technology Systems

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

About

This MS in Instructional Technology Systems program is intended for graduate students who plan to work with Instructional Technology Systems in two possible capacities:

Students in the Software Design in Instructional Technology Track emerge as accomplished software engineers and programmers. They will be prepared for jobs in software design and construction at Universities and at coding shops that specialize in educational software.

Students in the Systems Integration in Instructional Technology Track emerge as accomplished systems planners, systems analysts, and systems managers. They will be prepared for jobs in instructional software systems management, or as business/systems analysts at coding shops that specialize in educational software.

The MS in Instructional Technology Systems will equip the student with the core theories and skills to

advance to be the CIO or CTO of an instruction delivery organization. A primary focus of the degree is to develop practitioners at corporate training and development organizations. The degree is split into two tracks, matching the two capacities listed above. This program is guided by several curriculum principles:

- ~ Reflecting the eclectic and developing nature of current Internet and instructional technology design, this program does not presuppose any dominant technologies or programming languages. Rather, students will be exposed to a broad mix of technologies, programming languages and tools.
- ~ The program is designed to adapt to rapid changes in both technology and industry norms.
- ~ The program is designed around industry needs and based upon a long-term partnership with instructional technology leaders.
- ~ The program is designed to provide maximum opportunities for practicum and team projects.

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
- Advanced Phase Courses
- Elective Courses
- Capstone Course

Grade and GPA requirements

Prerequisite Courses

Fundamental Courses

Advanced Phase

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

Prerequisite Courses

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

Both Tracks

CSC 211 Programming in Java I
CSC 212 Programming in Java II
or CSC 224 Java for Programmers
or CSC 396 Programming in Java I and II

Software Design in Instructional Technology Track

CSC 373 Computer Systems I

CSC 374 Computer Systems II

CSC 383 Data Structures and Algorithms in Java

Systems Integration in Instructional Technology Track

IT 240 Introduction to Desktop Databases

CNS 340 Fundamentals of Information Assurance

IT 215 Analysis and Design Techniques

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 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 .

Fundamental 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 Instructional Technology Systems are

Both Tracks

HCI 440 Usability Engineering

HCI 460 Usability Evaluation Methods

ITS 427 Information Processing Models of Learning

ITS 431 Instructional Delivery and Course Management Systems

ITS 560 Instructional Technology Training and User Support

Software Design Track

DS 420 Foundations of Distributed Systems I

SE 450 Object-Oriented Software Development

Systems Integration in Instructional Technology Track

ITS 440 Distance Learning Technologies

HCI 445 Analysis and Design for HCI

Advanced Phase

Software Design in Instructional Technology Track

Options: Pick Three from the list below:

CSC 449 Database Technologies
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
DS 421 Foundations of Distributed Systems II
DS 520 System Design and Implementation with Distributed Object Frameworks
DS 575 Intelligent Information Retrieval
ECT 480 Intranets and Portals
HCI 422 Multimedia
HCI 423 Internet Multimedia
ITS 440 Distance Learning Technologies
ITS 584 Artificial Intelligence in Learning Environments
SE 452 Object-Oriented Enterprise Computing
SE 550 Distributed Software Development
TDC 460 Foundations of Communications Systems

Systems Integration in Instructional Technology Track

Options: Pick Three from the list below:

CSC 423 Data Analysis and Regression
CSC 424 Advanced Data Analysis
CSC 428 Data Analysis for Experimenters
ECT 425 Technical Fundamentals of Distributed Information Systems
ECT 433 Survey of Web Programming Technologies
ECT 480 Intranets and Portals
HCI 422 Multimedia
HCI 423 Internet Multimedia
HCI 430 Prototyping and Implementation
HCI 450 Foundations of Human-Computer Interaction
IS 450 Enterprise System Implementation
IS 511 Social Issues of Computing
IS 512 Groupware and Virtual Collaboration
IS 572 Information Security Management

Elective Courses

Both Tracks

Two open electives from CTI courses numbered 420-599

Capstone Course

Required Both Tracks

ITS 589 ITS Capstone Projects Course

Master's Degree in Software Engineering

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

About

Software Engineering is a discipline concerned with the practical problems of developing large-scale software systems. Software engineers are the architects of the software component of a computer-based system, providing several levels of representations or blueprints leading to specifications through which

programmers build the subsystems and modules of the system. Software development methodologies and management techniques combine with theories from mathematics and computer science in a cost-effective manner to solve real-world system development problems. This degree provides students with the theoretical foundations of software engineering, experience in team projects involving software development and management, hands-on experience with state-of-the-art tools, an understanding of advanced software development and management techniques, and exposure to the most recent developments and emerging technologies in SE.

All students complete any necessary prerequisite courses plus 13 graduate courses. All students are required to participate in an extensive team software development project using cutting edge technologies and the Software Engineering Research Seminar to keep them abreast of this rapidly changing field. For this reason, they are not required to take a Core Knowledge Examination. However, to be admitted into the program, they need to have demonstrated through their prior coursework that they can consistently perform at a B level or higher. Students complete the requirements of one of the three concentrations: Project Management, Software Development, or Software Systems.

The Project Management Concentration of the Master of Science in Software Engineering addresses the management of the quality of software products and processes and provides coursework in management and measurement techniques.

The Software Development Concentration of the Master of Science in Software Engineering 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 of the Master of Science in Software Engineering addresses the management and design of large-scale or enterprise-level software systems solutions. Emphasis is on integrating and balancing the needs and expectations of all stakeholders in the system, including customers, developers, and end users.

The Gaming and Entertainment Technologies Concentration of the Master of Science in Software Engineering addresses the foundations, methodologies, and tools for developing large-scale computer games and entertainment software systems. The emphasis is placed on the software architecture of such systems and their main components such as physics engines, artificial intelligence modules, and communication subsystems, etc.

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

Foundation Phase - All Concentrations

Advanced Phase

Elective Phase

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 and a grade of A in SE681, SE696 or SE698 will graduate with distinction.

Prerequisite Phase

Prerequisite Phase for Project Management, Software Development and Software Architecture

CSC 211 Programming in Java I
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

Prerequisite Phase for Gaming and Entertainment Technologies

GAM 224 Strategies in 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++

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

One of the following options*

Professional Option

Research Option**

*Gaming and Entertainment Technologies has a capstone instead of a studio

**Software Development and Project Management students only.

*** Software Architecture students may pursue a research option if they select these courses as electives.

Foundation Phase All Concentrations

SE 425 Principles and Practices of Software Engineering

SE 430 Object Oriented Modeling

SE 450 Object-Oriented Software Development

Additional Courses Required in Gaming and Entertainment Technologies

Offered Fall

SE 456 Architecture of Computer Games

HCI 440 Usability Engineering

GPH 425 Survey of Computer Graphics

Advanced Phase

Software Development Concentration

Required

SE 431 Formal Software Specification and Development I

Two of the following:

SE 473 Security Architecture I

SE 480 Software Architecture

SE 435 Foundations of Distributed Systems I

SE 552 Concurrent Software Development

Project Management Concentration

Required

SE 477 Software and Systems Project Management

Two of the following:

SE 468 Software Measurement/Project Estimation

SE 470 Software Development Processes

SE 482 Requirements Engineering

SE 529 Software Risk Management

Software Architecture Concentration

Required: **ECT556 Enterprise Architecture and Design**

HCI 440 Usability engineering

SE 480 Software architecture

SE 482 Requirements Engineering

SE 477 Software and Systems Project Management

One of:

IS 482 Legal aspects of IT

IS 572 Information Security Management

IS 560 Enterprise Systems

SE 468 Software Measurement/Project Estimation

SE 470 Software Development Processes

SE 529 Software Risk Management

Gaming and Entertainment Technologies Concentration

Required

SE 556 Advanced Architecture of Computer Games

One of the following:

GAM 476 Artificial Intelligence for Computer Games
SE 558 Architecture and Design for Multiplayer Games
CSC 480 Foundations of Artificial Intelligence
CSC 578 Neural Networks and Machine Learning

Two of the following:

SE 435 Foundations of Distributed Systems I
SE 473 Security Architecture I
SE 477 Software and Systems Project Management
SE 552 Concurrent Software Development
SE 550 Distributed Software Development
SE 542 Software Development for Limited and Embedded Devices
TDC 463 Computer Networks and Data Systems
TDC 573 Multimedia Networking
SE 435 Foundations of Distributed Systems I
SE 535 Foundations of Distributed Systems II
GAM 476 Artificial Intelligence for Computer Games
SE 558 Architecture and Design for Multiplayer Games
CSC 480 Foundations of Artificial Intelligence
CSC 578 Neural Networks and Machine Learning

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Master's Degree in Software Engineering □ Foundation Phase - All Concentrations

Foundation Phase - All Concentrations

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

Additional Courses Required in Gaming and Entertainment Technologies

Offered Fall

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

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

Advanced Phase

Software Development Concentration

Required

SE 431 Formal Software Specification and Development I

Two of the following:

SE 473 Security Architecture I
SE 480 Software Architecture
SE 435 Foundations of Distributed Systems I
SE 552 Concurrent Software Development

Project Management Concentration

Required

SE 477 Software and Systems Project Management

Two of the following:

- SE 468 Software Measurement/Project Estimation
- SE 470 Software Development Processes
- SE 482 Requirements Engineering
- SE 529 Software Risk Management

Software Architecture Concentration

Required:ECT556 Enterprise Architecture and Design

- HCI 440 Usability engineering
- SE 480 Software architecture
- SE 482 Requirements Engineering
- SE 477 Software and Systems Project Management

One of:

- IS 482 Legal aspects of IT
- IS 572 Information Security Management
- IS 560 Enterprise Systems
- SE 468 Software Measurement/Project Estimation
- SE 470 Software Development Processes
- SE 529 Software Risk Management

Gaming and Entertainment Technologies Concentration
Required

SE 556 Advanced Architecture of Computer Games

One of the following:

- GAM 476 Artificial Intelligence for Computer Games
- SE 558 Architecture and Design for Multiplayer Games
- CSC 480 Foundations of Artificial Intelligence
- CSC 578 Neural Networks and Machine Learning

Two of the following:

- SE 435 Foundations of Distributed Systems I
- SE 473 Security Architecture I
- SE 477 Software and Systems Project Management
- SE 552 Concurrent Software Development
- SE 550 Distributed Software Development
- SE 542 Software Development for Limited and Embedded Devices
- TDC 463 Computer Networks and Data Systems
- TDC 573 Multimedia Networking
- SE 435 Foundations of Distributed Systems I
- SE 535 Foundations of Distributed Systems II
- GAM 476 Artificial Intelligence for Computer Games
- SE 558 Architecture and Design for Multiplayer Games
- CSC 480 Foundations of Artificial Intelligence CSC 578 Neural Networks and Machine Learning

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

Elective Phase

Elective courses are in the range of 420-699, not including SE 465 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.

Software Development and Project Management

Two SE graduate level classes. CSC 447 and/or CSC 491 may be substituted for one or both of these electives.

One CTI elective. See elective course restrictions below.

At least one of the electives must be 500 level.

Software Architecture Concentration

Two SE courses or courses listed in the Advanced Phase of any concentration.

One CTI elective.

At least one of the electives must be 500 level.

Gaming and Entertainment Technologies Concentration

Two CTI elective courses in the range of 420-699, at least one SE.

Software Engineering Studio or Capstone Phase

Students in all concentrations are required to complete the following:

Students in the Software Development and Project Management 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 Software Architecture concentration are required to complete

SE 491 Software Engineering Studio

Or ECT 589 E-Commerce Technology Capstone

Software Development Professional Option

Students in the Software Development Concentration:

SE 477 Software and Systems Project Management

Students in the Project Management Concentrations:

One course listed in the Advanced Phase of either Software Development or Project Management concentration or any SE course above 500.

All students taking the Software Engineering Professional option must complete the following course:

SE 681 Software Engineering Professional Practices

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

SE 696 Master's Project

SE 698 Master's Thesis

Research Option

Students taking the research option must take the following course:

SE 690 Research Seminar

Students must also complete one of the following:

SE 696 Masters Project

SE 698 Masters 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.

Elective Course Restrictions

Elective courses are in the range of 420-699, not including SE 465 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's in Telecommunications Systems

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

About

The MS in Telecommunications Systems offers extensive theoretical and practical knowledge in voice and data communications 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 and data communications and network management.

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

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's in Telecommunications Systems □ Prerequisite Phase

Prerequisite Phase

CSC 211 Programming in Java I
or CSC 261 Programming Languages I: C/C++
or any more advanced programming course
IT 223 Data Analysis
CSC 202 Mathematics for Computer Science
TDC 311 Computers in Telecommunications Systems
or CSC 374 Computer Systems II
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's in Telecommunications Systems □ Foundation Phase

Foundation Phase

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 Telecommunications are:

TDC 460 Fundamentals of Communication Systems
TDC 463 Computer Networks
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.

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 Systems

TDC 567 Telecommunications System 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 .

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.

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 (CIPLITZ) 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

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Juris Doctorate and Master of Arts □ Sample Law School/CTI four-year course plan

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.

School of Computer Science, Telecommunications & Information Systems - Graduate Studies □ Doctorates and Masters □ Juris Doctorate and Master of Science □ Sample Law School/CTI four-year course plan

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 - 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

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.