

**DEPAUL  
UNIVERSITY**

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# **Course Catalog**

**College of Computing**

**Summer/Autumn 2009-2010**

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# General Information

College of Computing and Digital Media - Graduate Studies [General Information](#)

## Catalog Version

### **GRADUATE UPDATE: JUNE 15, 2009**

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

College of Computing and Digital Media - Graduate Studies [General Information](#) [Campus Locations](#)

## Campus Locations

The College of Computing and Digital Media (CDM) 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.

# College of Computing and Digital Media (CDM)

[College of Computing and Digital Media - Graduate Studies](#) ▫ [College of Computing and Digital Media \(CDM\)](#)

## About the College

The College of Computing and Digital Media offers graduate level, professional education in these areas: applied technology, artificial intelligence, business information technology, collaborative technologies, computer science, computer graphics and motion technology, computer vision, data analysis, database, data communications, data warehousing, digital cinema, distributed systems, e-commerce technology, game development, 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 College's 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 and digital media professions.

[College of Computing and Digital Media - Graduate Studies](#) ▫ [College of Computing and Digital Media \(CDM\)](#) ▫ [Administration](#)

## Administration

DAVID MILLER, PH.D.

Dean

LUCIA DETTORI, PH.D.

Associate Dean

MARTIN KALIN, PH.D.

Associate Dean

LIZ FRIEDMAN, PH.D.

Assistant Dean of Student Services

MARGIE MARTYN, PH.D., CCNA

Assistant Dean of Academic Administration

[Catalog Version](#)

[College of Computing and Digital Media - Graduate Studies](#) ▫ [College of Computing and Digital Media \(CDM\)](#) ▫ [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.

[College of Computing and Digital Media - Graduate Studies](#) ▫ [College of Computing and Digital Media \(CDM\)](#) ▫ [Student Services](#)

## Student Services

## Advising Staff

JOHN GLATZ  
Director of Advising

CARRIE JODELKA  
Academic Advisor

BECKY KROCHMAL  
Assistant Director of Advising

JACLYN MUSSELMAN  
Associate Director of Advising

## Graduate Admissions

REBECCA PHEND  
Associate Director of Admissions

AMANADA VIRZI  
Associate Director of Admissions

CAROLINE NIKOLAKAKIS  
Associate Director of Graduate Admissions

MICHAEL WESOLOWSKI  
Assistant Director of Graduate Admissions

College of Computing and Digital Media - Graduate Studies □ College of Computing and Digital Media (CDM) □ Facilities

## **Facilities**

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

The College of CDM itself operates specialized laboratories in the following:

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

## **Professional Development**

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

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

Current certificate program offerings include:

### **IPD 359 Web Development with Python Program**

A 5-week program covering Web development with the Python programming language.

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

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

### **IPD 363 SQL Server Database Administration Program**

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

### **IPD 364 Lightweight Java Web Development Program**

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

### **IPD 365 Ruby on Rails Program**

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

### **IPD 366 Java Web Services Program**

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

### **IPD 370 Advanced SQL Program**

A 2-week program covering advanced Structured Query Language (SQL) features

### **IPD 380 IT Project Management Program**

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

### **IPD 382 Java Developer Program**

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

### **IPD 389 .NET Developer Program**

A 10-week comprehensive program covering .NET technologies

### **IPD 392 Telecommunications Program**

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

### **IPD 394 Java EE Developer Program**

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

College of Computing and Digital Media - Graduate Studies □ College of Computing and Digital Media (CDM) □



# CDM Graduate Student Handbook

College of Computing and Digital Media - Graduate Studies ▢ CDM Graduate Student Handbook

## Introduction

In addition to the DePaul University Graduate Student Handbook, the College of Computing and Digital Media Graduate Student Handbook includes the rules and regulations for its graduate programs. Additional academic information and regulations applicable to our graduate programs appears in the specific graduate section.

As a graduate student you assume the responsibility to know and meet both the general and particular policies, and deadlines outlined in this catalog and handbook.

Specific Graduate Program Information can be found on each program page:

### PhD and MFA Programs

[Doctor of Philosophy in Computer Science](#)

[Master of Fine Arts in Digital Cinema](#)

### Master of Science Degree Programs

#### ***School of Computing***

[Applied Technology \(joint with SNL\)](#)

[Business Information Technology \(joint with KGSB\)](#)

[Computer Game Development \(joint with CIM\)](#)

[Computer Graphics and Motion Technology \(joint with CIM\)](#)

[Computational Finance \(joint with KGSB\) \\*\\*](#)

[Computer Science \\*](#)

[Computer, Information and Network Security \\*](#)

[E-Commerce Technology](#)

[Human-Computer Interaction \(joint with CIM\) \\*](#)

[Information Systems \\*](#)

[IT Project Management](#)

[Software Engineering \\*](#)

[Telecommunications Systems \\*](#)

[Juris Doctorate and Master of Science \(joint with LAW\)](#)

#### ***School of Digital Cinema and Interactive Media***

[Computer Game Development \(joint with SoC\)](#)

[Computer Graphics and Motion Technology \(joint with SoC\)](#)

[Digital Cinema](#)

[Human-Computer Interaction \(joint with SoC\) \\*](#)

### Master of Arts Degree Programs

#### ***School of Computing***

[Information Technology \\*](#)

[Juris Doctorate and Master of Arts \(joint with LAW\)](#)

#### ***School of Digital Cinema and Interactive Media***

[Master of Fine Arts in Digital Media](#)

\* Online Option Available

\*\* GRE or GMAT score required for admission

## **Dismissal/Probation**

Master's Degree students are required to meet all GPA requirements for their declared program. Once a student's cumulative GPA falls below that which is required, a student is allowed to complete an additional 16 credits or 3 quarters (whichever comes first) to return to good academic standing. If at the conclusion of this time period, the cumulative GPA remains below that which is required, the student may be dismissed from the program. A student is subject to probation as soon as his/her graduate GPA falls below 2.5. The student remains on probation until four more courses are taken, at which time another evaluation is made. If, at that time, the student has failed to raise his/her GPA to the required level of 2.5 the student may be dismissed for poor scholarship and prohibited from registering for additional coursework.

Doctoral student progress will be evaluated annually. Students must maintain a GPA 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 PhD committee will ask a student to withdraw from the doctoral program if the committee members judge that the student is not satisfactorily progressing toward the degree.

A student who has been dismissed may, after a period of time, petition for reinstatement. The petition, addressed to the dean of the college, would provide information that would demonstrate a change in the student's circumstances to an extent that would support successful completion of the student's degree program. The dean's decision, based upon the merits of the petition and the recommendation of the faculty of the student's department, may, if favorable stipulate conditions of reinstatement.

## **Evaluation and Credit/Limitations**

Using Undergraduate Credit for Graduate Courses:

All courses numbered 100 through 420 are considered to be at the undergraduate level and are not accepted for graduate credit. Exceptions to this policy include courses in the 400 level that are specifically required for a declared graduate program, courses from the Institute for Professional Development (IPD) that are indicated as applicable for graduate credits, and credit earned as part of a combined Bachelor/Master degree program.

### **TRANSFER CREDIT**

Transfer credit is not widely accepted at the graduate level. However, in certain circumstances and with the approval of the student's faculty advisor and the CDM dean's office, it will be considered. In all instances, a maximum of two courses will be considered for transfer into any CDM graduate degree program. Course work that has already been applied toward a degree may not be applied as transfer credit. This transfer credit policy also applies to credit earned in certificate programs through the Institute of Professional Development.

## **Graduation Requirements**

Students must successfully complete all of the general and specific degree requirements as listed in program pages of the catalog under which they were admitted. Students need to achieve the minimum grade point average indicated for their declared program of study to graduate. Specific graduation information for each program is listed on the program page .

[College of Computing and Digital Media - Graduate Studies](#) [▫ CDM Graduate Student Handbook](#) [▫ Grades, Repeating Classes](#)

## **Grades, Repeating Classes**

All grades from all graduate level courses are computed in the GPA. When a student repeats a graduate level course, both the old and new grades are calculated in the graduate GPA.

[College of Computing and Digital Media - Graduate Studies](#) [▫ CDM Graduate Student Handbook](#) [▫ Graduation with Distinction](#)

## **Graduation with Distinction**

Master of Arts and Master of Science degrees will be awarded with distinction to students who earned a cumulative graduate GPA of 3.9 or higher.

[College of Computing and Digital Media - Graduate Studies](#) [▫ CDM Graduate Student Handbook](#) [▫ Readmission](#)

## **Readmission**

Upon admission to a graduate program, a student is to follow the catalog requirements in effect at the time of initial enrollment. If a student was previously enrolled in a graduate program in CDM but has not been in attendance for a period for one calendar year or longer, the student must file a Re-admission Application. A student who is readmitted or who changes his or her program is subject to the terms of the catalog in effect at the time of readmission or program change.

[College of Computing and Digital Media - Graduate Studies](#) [▫ CDM Graduate Student Handbook](#) [▫ Registration](#)

## **Registration**

Students with a conditional degree seeking status must satisfactorily complete all prerequisite phase courses prior to enrolling in graduate level courses. Special exceptions to this policy may be authorized by the student's faculty advisor in consultation with a professional advisor in the CDM Academic Success Center.

To register for courses offered through other DePaul graduate programs and which are not required in the primary program, students must consult a professional advisor in the CDM Academic Success Center. Students must obtain permission from their faculty advisor in their primary program for these courses to apply to their graduate program. Students are

responsible for completing the required prerequisites for all courses in which they register. Please note that courses taken from other colleges may have a higher tuition rate.

# Programs in CDM

College of Computing and Digital Media - Graduate Studies ▢ Programs in CDM

## Current Degree Descriptions

### PhD and MFA Programs

Doctor of Philosophy in Computer Science

Master of Fine Arts in Digital Cinema

### Master of Science Degree Programs

#### *School of Computing*

Applied Technology (joint with SNL)

Business Information Technology (joint with KGSB)

Computer Game Development (joint with CIM)

Computer Graphics and Motion Technology (joint with CIM)

Computational Finance (joint with KGSB) \*\*

Computer Science \*

Computer, Information and Network Security \*

E-Commerce Technology

Human-Computer Interaction (joint with CIM) \*

Information Systems \*

IT Project Management

Software Engineering \*

Telecommunications Systems \*

Juris Doctorate and Master of Science (joint with LAW)

#### *School of Digital Cinema and Interactive Media*

Computer Game Development (joint with SoC)

Computer Graphics and Motion Technology (joint with SoC)

Digital Cinema

Human-Computer Interaction (joint with SoC) \*

### Master of Arts Degree Programs

#### *School of Computing*

Information Technology \*

Juris Doctorate and Master of Arts (joint with LAW)

#### *School of Digital Cinema and Interactive Media*

Master of Fine Arts in Digital Media

### Special Programs

Advanced Software Development Professional

Professional Development Programs

\* Online Option Available

\*\* GRE or GMAT score required for admission

# Online Learning

College of Computing and Digital Media - Graduate Studies ▢ Online Learning

## Welcome to CDM Online Learning

**DePaul CDM Online Learning** programs are specifically designed to compliment the busy lifestyle of working professionals. Our Course OnLine (COL) lecture playback system brings the unique experience of an on-campus DePaul CDM education to off-campus students, and gives them flexibility in how, when, and where they learn.

Course OnLine allows DePaul CDM to offer nearly over **80 individual courses** online each quarter. We offer **9 master's degree programs** that can be completed entirely online, including:

- Computer Science
- Computer, Information and Network Security
- E-Commerce Technology
- Information Systems
- Information Technology
- 
- Software Engineering
- Telecommunication Systems

Graduate students who wish to complete their degree through online learning do not register for a special online degree. Rather, they apply for one of our regular degree programs and then sign up for distance learning courses. **The degree earned by an online learning student is identical to the degree earned by an on-campus student.**

# Doctor of Philosophy in Computer Science

College of Computing and Digital Media - Graduate Studies ▯ Doctor of Philosophy in Computer Science

## Requirements

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 CDM faculty. To earn a Ph.D. degree, a student must demonstrate breadth of knowledge in at least two 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 CDM 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.

Applicants must:

- Hold a masters degree in Computer Science, Information Systems or an allied field. (Please see exemption below)
- 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.

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 courses from the Foundation Phase of the Master 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 to the doctoral program. Note: It is not the policy of the College 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 College 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.

The College has a limited number of scholarships available to fund full-time Ph.D. students. Only full-time students will be considered for substantial financial aid stipends. The deadlines to apply and submit all required supporting documents are:

- **For Winter:** October 1
- **For Autumn:** January 15

### **Completeness of Admission Credentials**

When important pieces of information such as transcripts are lacking, the College is compelled by University regulations to withdraw the application from consideration for admission. It is the applicants responsibility to ensure that all materials are submitted on time.

### **Overview of the Degree**

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

- Inquiry
- Research
- Candidacy

The Doctor of Philosophy in Computer and Information Sciences degree has two different tracks, which differ primarily in the structure of the Inquiry phase. Students must choose whether to enter the Computer Science or Information Systems track.

During the **Inquiry Phase** students in the Computer Science track will complete coursework, initial research projects, and two Breadth Examinations. They must also prepare themselves for a Depth Examination in their chosen area of research. This Depth exam will be completed during the Research phase. Students in the Information Systems track will complete coursework, research projects, and a comprehensive



exam.

The choice of breadth exams must be approved by the student's PhD advisor. Each Breadth Examination will verify that the student has knowledge sufficient to teach an introductory graduate course in that area. A student must pass both exams. Students who fail a Breadth Exam must re-take and pass the exam from the same breadth area in order to satisfy the breadth requirement. The Breadth Exam from each area can be re-taken at most once. Re-takes of breadth exams, or deviations from this policy due to special circumstances must be approved by the Ph.D. committee.

During the **Research Phase** students will conduct focused research leading to successful completion of a Dissertation Proposal. 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 Research Phase may overlap with the Inquiry Phase, in fact, students are strongly encouraged to begin their research, under the supervision of a faculty Ph.D. advisor, as early as possible upon entering the program.

Students will be assigned an advisor upon acceptance into the Ph.D. program; however the student may either choose to work with this advisor or else is responsible for approaching a different 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 Computing. The fourth committee member must be a recognized scholar from outside the College of CDM whose expertise is pertinent to the topic of the dissertation. The members of this committee must be approved by the Colleges Ph.D. Committee.

During the research 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.

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. Students may not defend their Dissertation Proposal until all depth and breadth or comprehensive exams are completed.

During the **Candidacy Phase** the Candidate conducts further research, and writes and defends the Ph.D. Dissertation.

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:** Specific courses as specified for each track under course requirements.
- **Doctoral Examinations:** Pass two Breadth Examinations and one Depth Examination (Computer Science track) or pass Comprehensive Examination (Information Systems track).
- **Defense of Proposal:** Successfully defend a Dissertation Proposal.

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.

The dissertation will be submitted to DePaul library following the currently published procedures. These will include making the dissertation available online where it will be permanently available to the public. Consult the Handbook for Graduate Studies at the back of this bulletin for information on submitting the dissertation and abstract to the College. 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. Information Systems track students must also complete IS 590: Information Systems Research Methods.

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 College towards the doctoral program course requirements.

### ***Student Progress***

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 recommend a student for dismissal 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.

### ***Time Limits***

#### **For part-time doctoral students:**

- No more than three years between admission to the doctoral program and completion of Breadth Examinations.
- No more than three 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 part-time doctoral students:**

- No more than three years between admission to the doctoral program and completion of Breadth Examinations.
- No more than three 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 for graduation application deadlines and the deadline for submitting completed dissertations.

# School of Computing (SoC)

College of Computing and Digital Media - Graduate Studies □ School of Computing (SoC)

## About the School of Computing

The **School of Computing** (SoC) houses CDM's technical degrees. With an emphasis on the theoretical as well as practical, students can earn degrees that prepare them for work in computing, programming, data storage, information processing, network security, software development, and computer graphics and motion technology.

College of Computing and Digital Media - Graduate Studies □ School of Computing (SoC) □ Faculty

## Faculty

DAVID MILLER, Ph.D.  
Dean  
University of Chicago

OLAYELE ADELAKUN, Ph.D.  
Associate Professor  
Turku School of Economics & Business Adm.

EHAB AL-SHAER, Ph.D.  
Associate Professor  
Old Dominican University

GARY ANDRUS, Ph.D.  
Associate Professor  
Wayne State University

ANDRE BERTHIAUME, Ph.D.  
Associate Professor  
University of Montreal

GIAN MARIO BESANA, Ph.D.  
Associate Professor  
University of Notre Dame

GREGORY BREWSTER, Ph.D.  
Associate Professor  
University of Wisconsin, Madison

ROBIN BURKE, Ph.D.  
Associate Professor  
Northwestern University

SUSY CHAN, Ph.D.  
Professor  
Syracuse University

I-PING CHU, Ph.D.  
Associate Professor  
State University of New York at Stony Brook

ANTHONY CHUNG, Ph.D.

Associate Professor  
University of Maryland Baltimore County

LUCIA DETTORI, Ph.D.  
Associate Professor and Associate Dean  
University of Paris XI

MASSIMO DIPIERRO, Ph.D.  
Assistant Professor  
University of Southampton, UK

CLARK ELLIOTT, Ph.D.  
Associate Professor  
Northwestern University

HELMUT EPP, Ph.D.  
Professor  
Northwestern University

XIAOWEN FANG, Ph.D.  
Associate Professor  
Purdue University

ROBERT FISHER, Ph.D.  
Associate Professor  
Harvard University

JACOB FURST, Ph.D.  
Associate Professor  
University of North Carolina at Chapel Hill

GERALD GORDON, Ph.D.  
Associate Professor  
University of California, Berkeley

PETER HASTINGS, Ph.D.  
Associate Professor  
University of Michigan, Ann Arbor

HENRY HARR, Ph.D.  
Professor Emeritus  
Illinois Institute of Technology

JANE HUANG, Ph.D.  
Assistant Professor  
University of Illinois at Chicago

LOUIS IBARRA, Ph.D.  
Assistant Professor  
University of Victoria

RADHA JAGADEESAN, Ph.D.  
Professor  
Cornell University

XIAOPING JIA, Ph.D.  
Professor  
Northwestern University

STEVE JOST, Ph.D.  
Associate Professor  
Northwestern University

MARTIN KALIN, Ph.D.

Professor and Associate Dean  
Northwestern University

IYAD KANJ, Ph.D.  
Associate Professor  
Texas A & M University

LINDA KNIGHT, Ph.D.  
Associate Professor  
DePaul University

JEAN-PHILIPPE LABRUYČRE, M.S.  
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GLENN LANCASTER, Ph.D.  
Associate Professor  
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STEPHEN LUECKING, M.F.A.  
Professor  
Miami University

EVELYN LULIS, Ph.D.  
Associate Professor  
Illinois Institute of Technology

STEVEN LYTINEN, Ph.D.  
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WILFREDO MARRERO, Ph.D.  
Associate Professor  
Carnegie Mellon University  
JOHN MCDONALD, Ph.D.  
Associate Professor  
Northwestern University

CRAIG MILLER, Ph.D.  
Associate Professor  
University of Michigan

DANIEL MITTLEMAN, Ph.D.  
Associate Professor  
The University of Arizona

BAMSHAD MOBASHER, Ph.D.  
Associate Professor  
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THOMAS MUSCARELLO, Ph.D.  
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MAKOTO NAKAYAMA, Ph.D.  
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CORIN PITCHER, Ph.D.  
Assistant Professor

University of Oxford

DANIELA RAICU, Ph.D.  
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Oakland University

JAMES RIELY, Ph.D.  
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University of North Carolina at Chapel Hill

JOHN ROGERS, Ph.D.  
Associate Professor  
University of Chicago

MARCUS SCHAEFER, Ph.D.  
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University of Chicago

ERIC SCHWABE, Ph.D.  
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Massachusetts Institute of Technology  
ERIC SEDGWICK, Ph.D.  
Associate Professor  
University of Texas

RAFFAELLA SETTIMI, Ph.D.  
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University of Perugia

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JANINE SPEARS, Ph.D.  
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ADAM STEELE, Ph.D.  
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THERESA STEINBACH, Ph.D.  
Assistant Professor  
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HAROLD STREETER, M.S.  
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Brown University

NORMA SUTCLIFFE, Ph.D.  
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NORIKO TOMURO, Ph.D.  
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CURT WHITE, Ph.D.  
Associate Professor  
Wayne State University

CHARLES WILCOX, B.A.  
Instructor  
Southern Illinois University

ROSALEE WOLFE, Ph.D.  
Professor  
Indiana University

JAMES YU, Ph.D.  
Assistant Professor  
Purdue University

## Master of Science in Applied Technology

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

Prospective students can find more information on this degree at the SNL website:  
[http://snl.depaul.edu/WebMedia/StudentResources/MSAT\\_flyer.pdf](http://snl.depaul.edu/WebMedia/StudentResources/MSAT_flyer.pdf)

The curriculum consists of three primary components:

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

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



# Master of Science in Business Information Technology

College of Computing and Digital Media - Graduate Studies ▫ School of Computing (SoC) ▫ Master of Science in Business Information Technology

## Requirements

The **Master of Science in Business Information Technology** is a joint degree between College of Computing and Digital Media (CDM) and the Kellstadt Graduate School of Business (KGSB).

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

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

## Admissions

Applications are accepted throughout the year and 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 College of CDM must possess a bachelor's degree from a regionally accredited institution (or be in the final stages of completing the undergraduate degree). CDM applicants are not required to submit results of an admissions test, however, if application is made through the Kellstadt School of Business, a GMAT score must be submitted.

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 admission requirements, please see:  
<http://www.cdm.depaul.edu/Pages/default2.aspx>

Or to apply online: <https://wa.is.depaul.edu/AdmissionApp/login.aspx>

## Program Requirements

Students in the **M.S. in Business Information Technology** program must complete courses in both the Kellstadt Graduate School of Business and the College of Computing and Digital Media.

### Required Coursework:

#### 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

#### From the School of Computing and Digital Media

CSC 451 Database Design  
IS 433 Information Security Management  
IS / PM 440 Collaborative Technologies for Leading Projects  
SE 477 Software and Systems Project Management  
TDC 425 Voice/Data Network Fundamentals

### **Three Electives:**

One chosen from Kellstadt Graduate School of Business , one chosen from the College of CDM, and one chosen from either the business school or from CDM:

### **Kellstadt Graduate School of Business courses available for use as electives:**

ACC 535 Accounting Systems  
ACC 555 Management Accounting for Decision Making  
MGT 501 Strategic Supply Chain Management  
MGT 506 Decision Making for Managers  
MGT 570 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  
MKT 595 Internet Marketing

### **CDM courses available for use as electives:**

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 435 Organizational Modeling  
IS / PM 570 Enterprise System Implementation  
IS 482 Legal Aspects of Information Technology  
IS 505 Business Continuity/Disaster Recovery Theories and Strategies  
IS 511 Social Issues of Computing  
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 432 Web Architecture for Non-Programmers  
IT 498 Topics in Global Information Technology  
SE 427 Software Quality Management  
TDC 463 Computer Networks and Data Systems

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### **Program, Grade and GPA requirements**

The MS in Business Information Technology Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

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

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

## Master of Science in Computer Game Development

College of Computing and Digital Media - Graduate Studies □ School of Computing (SoC) □ Master of Science in Computer Game Development

### Requirements

The **MS in Computer Game Development** is designed for those interested in game development programming at the highest level, including computer science and computer graphics professionals retooling for the game industry.

This degree program consists of:

- Prerequisite Phase
- Foundation Phase
- Advanced Phase
- Major Electives
- Open Electives
- Capstone

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### Course Requirements

#### ***Prerequisite Phase***

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

CSC 261    Programming Languages I: C/C++  
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  
**or** CSC 393 Data Structures in C++  
GPH 321    Computer Graphics Development  
**or** a linear algebra equivalent  
MAT 150    Calculus I

Evaluation of prerequisite competencies will follow standard CDM practice: 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. 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 by logging in to MyCDM.

#### ***Foundation Phase***

The Foundation Phase provides a common foundation in computer game development. Students are required to complete these courses before moving to the Advanced Phase.

GAM 424 Game Design Workshop  
GAM 474 Action Games Programming  
GAM 475 Game Engine Programming I

### **Advanced Phase**

The Advanced Phase provides specialized knowledge in computer game development topics, as well as allowing students to choose a particular emphasis for their studies.

Students must successfully complete the following courses:

GAM 450 Physics for Game Developers  
GAM 476 Artificial Intelligence for Computer Games  
CSC 421 Applied Algorithms and Structures  
GPH 469 Computer Graphics Development  
GAM 575 Game Engine Programming II

### **Major Electives**

Students must also successfully complete two courses from the following list of Major Electives:

CSC 443 Introduction to Operating Systems  
CSC 447 Concepts of Programming Languages  
CSC 448 Compiler Design  
CSC 451 Database Design  
CSC 480 Foundations of Artificial Intelligence  
CSC 578 Neural Networks and Machine Learning  
GAM 490 Multiplayer Game Development  
GAM 599 Topics in Computer Game Design and Development  
GPH 438 Computer Animation Survey  
GPH 448 Computer Graphics Scripting  
GPH 539 Advanced Rendering Techniques  
GPH 540 Procedural Shading  
GPH 541 Advanced Lighting Techniques  
GPH 570 Visualization  
GPH 572 Principles of Computer Animation  
GPH 575 Advanced Graphics Development  
SE 430 Object Oriented Modeling  
SE 433 Software Testing and Quality Assurance  
CSC 435 Distributed Systems I  
SE 450 Object-Oriented Software Development  
SE 477 Software and Systems Project Management  
CSC 536 Distributed Systems II  
CSC 534 Software Development for Limited and Embedded Devices  
CSC 552 Concurrent Software Development  
SE 558 Architecture and Design for Multiplayer Games  
or any graduate GAM course

### **Open Electives**

Students must also complete one elective course in the range of 420-699, from any CDM program.

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

### **Capstone**

GAM 690 Game Development Studio I  
GAM 691 Game Development Studio II

Students must register for GAM 690 and GAM 691 in consecutive quarters. A grade will not be assigned for GAM 690 until GAM 691 has been completed.

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## **Program, Grade and GPA Requirements**

The MS in Computer Game Development consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

A grade point average of at least 2.5 (A=4.0) must be maintained in all course work toward the master's degree. Courses in which a grade of C- (1.7) or lower is earned will not apply toward a graduate degree.

# Master of Science in Computer Graphics and Motion Technology

College of Computing and Digital Media - Graduate Studies □ School of Computing (SoC) □ Master of Science in Computer Graphics and Motion Technology

## **Requirements**

### **ABOUT**

The **MS in Computer Graphics and Motion Technology** is a study of the technical and visual foundations for the design and software development of Computer Graphics and Animation. This program prepares students for technical careers in the graphics industry ranging from entertainment to data visualization for science and medicine.

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

- Gain 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 interaction design, modeling objects, controlling cameras, rigging characters for animation and using particle and surface techniques
- 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
- Become appreciative of the two cultures of computer graphics the one drawing on communication design and the other deriving from computer science.

This degree prepares students for careers in graphics/animation production and software development. Students acquire both the aesthetic and technical knowledge required in this changing industry.

Students can choose from three concentrations, depending on their career aspirations:

- **Developer**
- **Technical Director**

- **Visualization**
- 

## Developer Concentration

A more traditional computer science path, focusing on the mathematical and programming techniques necessary to build graphics/animation software. Developers study not only the necessary data structures to build software such as game engines and production renderers but also the knowledge required to know what software artists will need and how they will use it.

### Course Requirements

#### Prerequisite Phase

IT 240	Introduction to Desktop Databases <a href="#">Self Placement Test Available</a>
CSC 261	Programming in C++ I
CSC 262	Programming in C++ II
CSC 393	Data Structures in C++
HCI 402	Foundations of Digital Design
GPH 212	Perceptual Principles for Digital Environments II
MAT 150	Calculus I
or MAT 160	Calculus for Mathematics and Science Majors I
or MAT 170	Calculus I with Scientific Applications (Recommended)

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 an online Change of Status request when the Prerequisites 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 MyCDM.

#### Foundation Phase

GPH 425	Survey of Computer Graphics
GPH 438	Computer Animation Survey
GPH 448	Computer Graphics Scripting
HCI 470	Digital Page Formatting I
GPH 436	Fundamentals of Computer Graphics
GPH 469	Computer Graphics Development

#### Advanced Phase

GPH 572	Principles of Computer Animation
GPH 539	Advanced Rendering Techniques
GPH 570	Visualization
GPH 580	Hardware Shading Techniques

#### Major Electives \*

One GPH course	420 level or above
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#### Open Electives \*

Two CDM courses

420 level or above

\* At least one of the above 3 electives must be 500 level or above. Elective courses must not have been otherwise used to satisfy degree requirements.

## **Program, Grade and GPA Requirements**

The MS in Computer Graphics and Motion Technology Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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 3.9 or higher will graduate with distinction.

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## **Technical Director Concentration**

Prepares students for jobs that facilitate artistic production. It gives students a solid aesthetic background while also providing a firm grounding in the scripting techniques necessary to take the industrys software as far as it can go in realizing the artists creative intent. Graduates will be able to assist creative directors in such activities as creating virtual sets, adjusting lighting, asset management and rigging characters for animation.

### **Course Requirements**

#### **Prerequisite Phase**

IT 240	Introduction to Desktop Databases <a href="#">Self Placement Test Available</a>
CSC 211	Programming in Java I <a href="#">Self Placement Test Available</a>
<b>and</b> CSC 212	Programming in Java II
<b>or</b> CSC 261	Programming in C++ I
<b>and</b> CSC 262	Programming in C++ II
<b>or</b> CSC 224	Java for Programmers
<b>or</b> CSC 396	Programming in Java I and II
GPH 259	Design Geometry
HCI 402	Foundations of Digital Design
GPH 212	Perceptual Principles for Digital Environments II

The Technical Designer prerequisite concentration requires two quarters of programming in either Java or C/C++ so students entering with prior course work in C++ will satisfy this requirement. Any Technical Designer student who wishes to eventually take courses in the Developer concentration as electives is encouraged to take the C++ programming track CSC 261 and CSC 262 to satisfy the prerequisite programming requirement.

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 an online Change of Status request when the Prerequisites 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 MyCDM.

#### **Foundation Phase**

GPH 425	Survey of Computer Graphics
GPH 438	Computer Animation Survey
GPH 448	Computer Graphics Scripting

HCI 470	Digital Page Formatting I
HCI 440	Usability Engineering
GPH 450	Digital Modeling I

**Advanced Phase**

HCI 422	Multimedia
GPH 560	Modeling Spaces
GPH 565	Designing for Visualization
GPH 539	Advanced Rendering Techniques

**Major Electives \***

One GPH course 420 level or above

**Open Electives \***

Two CDM courses 420 level or above

\* At least one of the above 3 electives must be 500 level or above. Elective courses must not have been otherwise used to satisfy degree requirements.

**Suggested Electives**

CSC 421	Applied Algorithms and Structures
CSC 423	Data Analysis and Regression
CSC 482	Applied Image Analysis
CSC 483	Information Processing Management
CSC 521	Monte Carlo Algorithms
GPH 448	Computer Graphics Scripting
GPH 487	Forensic Animation
GPH 536	Smooth Surface Modeling for Graphics and Animation
GPH 540	Procedural Shading
GPH 575	Advanced Graphics Development

***Program, Grade and GPA Requirements***

The MS in Computer Graphics and Motion Technology Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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 3.9 or higher will graduate with distinction.

**Visualization Concentration**

Focuses on graphics/animation for displaying, explaining and analyzing scientific and medical data. Visualization displays numerical data in an accurate, high-density and compact form in which patterns are revealed, emphasized and clearly communicated. Students focus on the mathematics, statistics and programming techniques necessary to analyze and display such data. At the same time students are given a firm grounding in the aesthetics that allow them to build visualizations that communicate effectively and beautifully.

***Course Requirements***

**Prerequisite Phase**



IT 223	Data Analysis
CSC 261	Programming in C++ I
CSC 262	Programming in C++ II
CSC 393	Data Structures in C++
MAT 150	Calculus I
or MAT 160	Calculus for Mathematics and Science Majors I
or MAT 170	Calculus I with Scientific Applications**
MAT 151	Calculus II
or MAT 161	Calculus for Mathematics and Science Majors II
or MAT 171	Calculus II with Scientific Applications**
HCI 402	Foundations of Digital Design

\*\* Recommended

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 an online Change of Status request when the Prerequisites 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 MyCDM.

**Foundation Phase**

GPH 425	Survey of Computer Graphics
GPH 436	Fundamentals of Computer Graphics
HCI 440	Usability Engineering
CSC 431	Scientific Computing
HCI 470	Digital Page Formatting I
GPH 469	Computer Graphics Development

**Advanced Phase**

GPH 572	Principles of Computer Animation
CSC 481	Introduction to Image Processing
GPH 570	Visualization
GPH 580	Hardware Shading Techniques

**Major Electives \***

One GPH course 420 level or above

**Open Electives \***

Two CDM courses 420 level or above

\* At least one of the above 3 electives must be 500 level or above. Elective courses must not have been otherwise used to satisfy degree requirements.

**Suggested Electives**

GPH 438	Computer Animation Survey
GPH 450	Digital Modeling I
GPH 539	Advanced Rendering Techniques
GPH 560	Modeling Spaces

## **Program, Grade and GPA Requirements**

The MS in Computer Graphics and Motion Technology Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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 3.9 or higher will graduate with distinction.

## Master of Science in Computational Finance

College of Computing and Digital Media - Graduate Studies □ School of Computing (SoC) □ Master of Science in Computational Finance

### **Requirements**

The **Master of Science in Computational Finance** is a joint degree between the College of Computing and Digital Media (CDM) 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**

Admission to this joint program is open to both students from the College of Computing and Digital Media and the Kellstadt Graduate School of Business. 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 are admitted to the MS in Computational Finance throughout the year.

The **Master of Science in Computational Finance** program is composed of three phases:

- Prerequisite
- Foundation

- Advanced
- 

## Required Coursework

### Prerequisite Phase

Students must complete a two-course calculus sequence:

- MAT 150     Calculus I
- and MAT 151 Calculus II
- or MAT 160   Calculus for Mathematics and Science Majors I
- and MAT 161 Calculus for Mathematics and Science Majors II
- or MAT 170   Calculus I with Scientific Applications
- and MAT 171 Calculus II with Scientific Applications

Students must complete the following coursework:

- CSC 261     Programming Languages I: C/C++
- and CSC 262 Programming Languages II: C/C++
- or CSC 309   Object-Oriented Programming in C++

Students must also complete one of the following courses:

- CSC 202     Discrete Structures for Computer Science
- or CSC 321 Design and Analysis of Algorithms

### Foundation Phase

The following courses from the Kellstadt Graduate School of Business are required:

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

The following courses from the College of Computing and Digital Media are required:

- CSC 423     Data Analysis and Regression
- CSC 425     Time Series Analysis and Forecasting
- CSC 431     Scientific Computing
- or CSC 485 Numerical Analysis
- CSC 521     Monte Carlo Algorithms

### Advanced Phase

Students must also complete one of the following courses:

- CSC 696     Master's Research
- or CSC 697 Graduate Internship
- or CSC 559 Software Project: Developing Financial Engines

### *Open Elective:*

Students must successfully complete one elective chosen from any 500-level course in the College of CDM.

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## **Program, Grade and GPA Requirements:**

The MS in Computational Finance Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

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

Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree. Students will not be approved for graduation with less than a 2.50 GPA. Students with a GPA of 3.9 or higher will graduate with distinction

## **Master of Science in Computer Science**

College of Computing and Digital Media - Graduate Studies ▢ School of Computing (SoC) ▢ Master of Science in Computer Science

### **Requirements**

The **Master of Science degree in Computer Science** prepares students for a professional career in Software Development or Computer Science Research. The program exposes students to the complete life-cycle of computer application development including abstraction, modeling and algorithm development, leveraging computer systems, programming languages and development frameworks, and software development techniques and processes. Students also have the opportunity to study -- and develop applications in -- diverse applied areas such as:

- Computer Security
- Robotics and Computer Vision
- Data Mining and Knowledge Discovery
- Databases
- Mobile and Embedded Systems
- Intelligent Systems
- Computer Games
- Distributed Systems and Web Development
- Computer Graphics
- Computer Games, and more

Graduates of the Computer Science Master's program are typically employed as developers and software engineers, and many also pursue a Ph.D. degree.

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

- Programming and Software Development
- Algorithm Design and Computer Science Concepts
- Computer and Database Systems

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

- Knowledge of key computer science concepts, techniques and algorithms.
- An understanding of the workings and the API (Application Programming Interface) of modern computer systems including database systems.
- Skills in programming and software development.
- Expertise in your chosen area of Computer Science.
- Research skills and experiences that can be applied in any endeavor.

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## Course Requirements

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

- Prerequisite Phase
- Foundation Phase
- Major Electives Phase

### ***Prerequisite Phase***

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

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

By taking these courses and receiving a grade of a B- or better in each, the student will have completed the requirements of the Prerequisite Phase. All or part of the Prerequisite Phase may be waived if a student has the equivalent academic background. Alternatively, students with practical experience may complete a Graduate Assessment Examination (GAE) to show competency in a prerequisite. All students are blocked from enrolling in 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 Foundation Phase of the program. Students may submit the Change of Status request by logging in to MyCDM.

### ***Foundation Phase***

The Foundation Phase consists of five graduate courses that provide the foundation in the three core areas of algorithm development, computer systems and software development:

CSC 421 Applied Algorithms and Structures  
CSC 435 Distributed Systems I  
CSC 447 Concepts of Programming Languages  
CSC 453 Database Technologies  
SE 450 Object-Oriented Software Development

Fully admitted students in the Foundation Phase may register for a maximum of four Advanced Phase courses.

### ***Major Electives Phase (8 courses)***

Graduates of our Computer Science Master of Science program must be experts in at least one broad area of Computer Science:

- Software and system development

- Theory
- Database systems
- Software engineering
- Artificial intelligence
- Computer security
- Multimedia systems

For this reason a student will take the remaining 8 elective courses as follows:

- 4 courses from one area
- 4 additional courses from any area
  - Including the option to take the 2-course SE Studio sequence, the 1-course CS capstone or write an MS Thesis, or develop an MS Research Project

The courses in each area are listed below. The Independent Study courses (CSC 695) may be taken for up to 8 credits and at most 4 credit hours of CSC 695 can count towards the chosen area.

Special requirements for the Software and System Development area

Many graduates of our Computer Science program work as software developers. Students choosing to specifically prepare for this career path should choose the software and system development area; they will also be required to take at least one course from the Software Engineering area and the CS capstone course. OR the 2-course Software Engineering Studio course sequence. The complete requirements for students choosing this area are:

- 4 courses from the Software and System Development area
- Either
  - 1 course from the Software Engineering area and the Computer Science Capstone, or
  - the SE Studio 2-course sequence
- 2 elective courses from any area.

Areas

**Software and System Development area**

- CSC 438 Frameworks for Web Application Development
- CSC 439 Computer Security
- CSC 443 Introduction to Operating Systems
- CSC 448 Compiler Design
- CSC 548 Advanced Compiler Design
- CSC 549 Database System Implementation
- CSC 551 Distributed Database Systems
- CSC 553 Advanced Database Concepts
- CSC 536 Distributed Systems II
- CSC 540 Software Development for Mobile and Wireless Systems
- CSC 534 Software Development for Limited and Embedded Devices
- CSC 552 Concurrent Software Development
- SE 560 Structured Document Interchange and Processing
- SE 452 Object-Oriented Enterprise Computing
- SE 554 Enterprise Component Architecture
- CNS 450 Computer Forensics

**Theory area**

- CSC 431 Scientific Computing
- CSC 440 Cryptology
- CSC 444 Automata Theory and Formal Grammars
- CSC 489 Theory of Computation
- CSC 491 Advanced Algorithms
- CSC 503 Parallel Algorithms

CSC 521 Monte Carlo Algorithms  
CSC 525 Combinatorial Optimization  
CSC 531 Introduction to Bioinformatics  
CSC 535 Formal Semantics of Programming Languages  
CSC 557 Foundations of Computer Security  
CSC 547 Advanced Topics in Program Languages  
CSC 580 Design of Object-Oriented Languages  
CSC 591 Topics in Algorithms

### **Database Systems area**

CSC 452 Database Programming  
CSC 454 Database Administration and Management  
CSC 543 Spatial Databases and Geographic Information Systems  
CSC 549 Database System Implementation  
CSC 551 Distributed Database Systems  
CSC 553 Advanced Database Concepts  
CSC 554 Advanced Database Management  
CSC 575 Intelligent Information Retrieval  
CSC 589 Topics in Database

### **Artificial Intelligence area**

CSC 457 Expert Systems  
CSC 458 Symbolic Programming  
CSC 475 Introduction to Robotics  
CSC 480 Foundations of Artificial Intelligence  
CSC 578 Neural Networks and Machine Learning  
CSC 587 Cognitive Science  
CSC 594 Topics in Artificial Intelligence  
CSC 575 Intelligent Information Retrieval  
CSC 481 Introduction to Image Processing  
CSC 484 Introduction to Computer Vision  
CSC 498 Digital Signal Processing  
CSC 538 Vision Systems  
CSC 482 Applied Image Analysis  
CSC 584 Computer Vision  
CSC 592 Topics in Computer Vision and Pattern Recognition  
CSC 423 Data Analysis and Regression  
CSC 424 Advanced Data Analysis  
CSC 425 Time Series Analysis and Forecasting  
CSC 428 Data Analysis for Experimenters  
ECT 584 Web Data Mining for Business Intelligence

### **Software Engineering area**

SE 430 Object Oriented Modeling  
SE 433 Software Testing  
SE 453 Architecture and Frameworks for Developing Client Applications  
SE 457 Service-Oriented Architecture  
SE 468 Software Measurement/Project Estimation  
SE 470 Software Development Processes  
SE 477 Software and Systems Project Management  
SE 480 Software Architecture  
SE 482 Requirements Engineering  
SE 525 Software Security Architecture  
SE 526 Software Security Assessment  
SE 529 Software Risk Management  
SE 533 Formal Software Validation and Verification  
SE 546 Software Architecture and Design for Desktop Applications  
SE 549 Model-Driven Software Development

### **Security area**

CNS 450 Computer Forensics  
CSC 439 Computer Security

CSC 440 Cryptology  
CSC 554 Advanced Database Management  
CSC 557 Foundations of Computer Security  
SE 525 Software Security Architecture  
SE 526 Software Security Assessment  
TDC 588 Advanced Network Defense Systems

### **Multimedia Systems area**

GAM 450 Physics for Game Developers  
GAM 453 Tool Programming for Game Development  
GAM 474 Action Games Programming  
GAM 475 Game Engine Programming I  
GAM 476 Artificial Intelligence for Computer Games  
GAM 490 Multiplayer Game Development  
GAM 575 Game Engine Programming II  
GAM 690 Game Development Studio I  
GAM 691 Game Development Studio II  
GPH 436 Fundamentals of Computer Graphics  
GPH 469 Computer Graphics Development  
GPH 570 Visualization  
GPH 572 Principles of Computer Animation  
GPH 580 Hardware Shading Techniques  
HCI 440 Usability Engineering  
SE 456 Architecture of Computer Games  
SE 556 Advanced Architecture of Computer Games  
SE 558 Architecture and Design for Multiplayer Games  
TDC 573 Multimedia Networking

### **Master's Independent Study**

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

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### **Master's Research**

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

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### **Master's Thesis**

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

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## Program, Grade and GPA Requirements

The MS in Computer Science Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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.

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

College of Computing and Digital Media - Graduate Studies □ School of Computing (SoC) □ Master of Science in Computer, Information and Network Security

### Requirements

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

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

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

### What Students Will Learn From The Program

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

### Concentrations

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

context of modern enterprise-scale & web-based systems.

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

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

The **Regulation, Compliance, & Audit** concentration focuses on the impact of Information Assurance legislation and IT security controls requirements on Enterprises. This cross-disciplinary concentration covers information assurance in the context of IT and financial auditing, and providing a sound foundation for students looking for a career in auditing, compliance and information security management.

**Note** : Some required courses in the Regulation, Compliance & Audit concentration are **not** available via Online Learning.

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

- Prerequisite Phase
- Foundation Phase
- Advanced Phase
- Capstone or Thesis

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## **Computer Security Concentration**

### **Course Requirements**

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

#### **Prerequisite 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. The student must receive a grade of a B- or better in each class taken, in order to successfully complete 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 MyCDM.

CSC 211     Programming in Java I [Self Placement Test Available](#)  
and CSC 212 Programming in Java II  
or CSC 224     Java for Programmers [Self Placement Test Available](#)  
or CSC 396     Programming in Java I and II  
CSC 373     Computer Systems I  
CSC 374     Computer Systems II

### **Foundation Phase**

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.

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

A student must achieve an average grade of 3.0 or better in the five 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 seek faculty advising guidance to discuss their options.

The following courses are required:

CSC 435 Distributed Systems I  
SE 450 Object-Oriented Software Development  
TDC 477 Network Security  
IS 511 Social Issues of Computing  
or CNS 477 Legal Issues in Information Assurance  
IS 433 Information Security Management

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

### **Advanced Phase**

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 students faculty advisor.

The Advanced Phase is composed of three parts:

- Concentration Area
- Major Elective
- Open Electives
- Capstone or Thesis Requirement

#### *Concentration Area Coursework*

Students must complete the following course:

CSC 439 Computer Security

Students must complete two (2) of the following four (4) courses:

CSC 440 Cryptology  
SE 525 Software Security Architecture  
SE 526 Software Security Assessment  
CSC 557 Foundations of Computer Security

Students must complete one (1) of the following courses (not counting courses taken to satisfy the requirements above):

CNS 450 Computer Forensics  
CSC 440 Cryptology  
SE 482 Requirements Engineering  
SE 525 Software Security Architecture  
SE 526 Software Security Assessment  
SE 529 Software Risk Management  
CSC 536 Distributed Systems II  
CSC 557 Foundations of Computer Security  
TDC 577 Network Security II  
or TDC 588 Advanced Network Defense Systems

### *Major Elective*

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

### *Open Electives*

Students must complete two (2) Open Electives.

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

### **Capstone or Thesis**

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

Students must take one of the following:

CNS 594 Computer Information and Network Security Capstone  
or CSC 698 Master's Thesis  
or ECT 698 Master's Thesis  
or IS 698 Master's Thesis  
or SE 698 Master's Thesis  
or TDC 698 Master's Thesis

### **Program, Grade and GPA Requirements**

The MS in Computer, Information and Network Security Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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.

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

### **Course Requirements**

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

#### ***Prerequisite 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. The student must receive a grade of a B- or better in each class taken, in order to successfully complete 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 MyCDM.

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  
IT 215        Analysis and Design Techniques [Self Placement Test Available](#)  
ECT 310      Internet Application Development  
TDC 361      Basic Communication Systems

### ***Foundation Phase***

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.

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

A student must achieve an average grade of 3.0 or better in the five 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 seek faculty advising guidance to discuss their options.

The following courses are required:

IS 425        Enterprise Information  
TDC 463      Computer Networks and Data Systems  
TDC 477      Network Security  
IS 511        Social Issues of Computing  
or CNS 477    Legal Issues in Information Assurance  
IS 433        Information Security Management

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

### ***Advanced Phase***

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 students faculty advisor.

The Advanced Phase is composed of three parts:

- Concentration Area
- Major Elective
- Open Electives
- Capstone or Thesis Requirement

#### *Concentration Area Coursework*

Students must complete the following course:

IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance

Students must complete three (3) of the following twelve (12) courses:

SE 430 Object Oriented Modeling  
IS 511 Social Issues of Computing \*  
CNS 477 Legal Issues in Information Assurance \*  
IS 483 Information Services and Operations  
IS 540 Global Information Technology  
ECT 582 Secure Electronic Commerce  
ECT 585 Legal Aspects of E-Commerce  
IS 505 Business Continuity/Disaster Recovery Theories and Strategies  
IS 506 Business Continuity/Disaster Recovery Management  
SE 529 Software Risk Management  
SE 482 Requirements Engineering  
TDC 577 Network Security II

or TDC 588 Advanced Network Defense Systems

\* This course cannot be counted in this category if used for Foundation Phase fulfillment.

#### *Major Elective*

Students must complete one course from any CINS concentration area. It can be from their concentration area or any others. That course cannot be used to fulfill a student's CINS Concentration Area or Foundation Phase requirements.

#### *Open Electives*

Students must complete two CDM open electives.

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

#### **Capstone or Thesis Requirement**

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

Students must take one of the following:

CNS 594 Computer Information and Network Security Capstone

or CSC 698 Master's Thesis

or ECT 698 Master's Thesis

or IS 698 Master's Thesis

or SE 698 Master's Thesis

or TDC 698 Master's Thesis

#### **Program, Grade and GPA Requirements**

The MS in Computer, Information and Network Security Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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.

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## **Network Security Concentration**

### **Course Requirements**

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

#### **Prerequisite 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. The student must receive a grade of a B- or better in each class taken, in order to successfully complete 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 MyCDM.

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

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

or any more advanced programming course

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

TDC 311 Computers in Telecommunications Systems

or CSC 373 Computer Systems I

TDC 361 Basic Communication Systems

#### **Foundation Phase**

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.

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

A student must achieve an average grade of 3.0 or better in the five 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 seek faculty advising guidance to discuss their options.

The following courses are required:

TDC 460 Foundations of Communications Systems

TDC 463 Computer Networks and Data Systems  
TDC 477 Network Security  
IS 511 Social Issues of Computing  
or CNS 477 Legal Issues in Information Assurance  
IS 433 Information Security Management

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

### ***Advanced Phase***

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 students faculty advisor.

The Advanced Phase is composed of three parts:

- Concentration Area
- Major Elective
- Open Electives
- Capstone or Thesis Requirement

#### *Concentration Area Coursework*

Students must complete the following three (3) courses:

TDC 511 Telecommunications Practicum  
TDC 563 Protocols and Techniques for Data Networks  
TDC 577 Network Security II  
or TDC 588 Advanced Network Defense Systems

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

TDC 561 Network Programming  
TDC 562 Computer-Communication Network Design and Analysis  
TDC 567 Telecommunication Systems Design and Management  
ECT 582 Secure Electronic Commerce

#### *Major Elective*

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

#### *Open Electives*

Students must complete two Open Electives.

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

#### ***Capstone or Thesis Requirement***

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

Students must take one of the following:

CNS 594 Computer Information and Network Security Capstone  
or CSC 698 Master's Thesis  
or ECT 698 Master's Thesis



or IS 698 Master's Thesis

or SE 698 Master's Thesis

or TDC 698 Master's Thesis

### **Program, Grade and GPA Requirements**

The MS in Computer, Information, and Network Security Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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.

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## ***Regulation, Compliance & Audit Concentration***

### **Course Requirements**

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

#### ***Prerequisite 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. The student must receive a grade of a B- or better in each class taken, in order to successfully complete 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 MyCDM.

The following course is required:

TDC 361 Basic Communication Systems

or IT 263 Applied Networks and Security

#### ***Foundation Phase***

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.

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

A student must achieve an average grade of 3.0 or better in the five 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 seek faculty advising guidance to discuss their options.

Students must complete the following five (5) courses:

ACC 500 Financial Accounting  
TDC 463 Computer Networks and Data Systems  
TDC 477 Network Security  
CNS 477 Legal Issues in Information Assurance  
IS 433 Information Security Management

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

### **Advanced Phase**

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 students faculty advisor.

The Advanced Phase is composed of three parts:

- Concentration Area
- Major Elective
- Open Electives
- Capstone or Thesis Requirement

#### *Concentration Area Coursework*

Students must complete the following three (3) courses:

ACC 541 Financial Accounting Theory and Practice I  
ACC 547 Audit and Regulation of Corporate Financial Reporting  
IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance

Students must complete one (1) of the following nine (9) courses:

ACC 550 Advanced Topics in Auditing  
ACC 543 Financial Accounting Theory and Practice II  
ACC 552 Legal and Ethical Environment of Accounting Practice  
ECT 582 Secure Electronic Commerce  
IS 425 Enterprise Information  
IS 505 Business Continuity/Disaster Recovery Theories and Strategies  
IS 506 Business Continuity/Disaster Recovery Management  
IS 511 Social Issues of Computing  
TDC 577 Network Security II  
or TDC 588 Advanced Network Defense Systems

#### *Major Elective*

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

#### *Open Electives*

Students must complete two Open Electives.

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

## **Capstone or Thesis Requirement**

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

Students must take one of the following:

CNS 594 Computer Information and Network Security Capstone

or CSC 698 Master's Thesis

or ECT 698 Master's Thesis

or IS 698 Master's Thesis

or SE 698 Master's Thesis

or TDC 698 Master's Thesis

## **Program, Grade and GPA Requirements**

The MS in Computer, Information and Network Security Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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.

# Master of Science in E-Commerce Technology

College of Computing and Digital Media - Graduate Studies □ School of Computing (SoC) □ Master of Science in E-Commerce Technology

## **Requirements**

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

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

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

Students may also expand their competencies in

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

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

- Computer programming and database technology
- Web engineering methodology, user-centered design, and systems development life cycle

- Web services, e-commerce servers, Web 2.0
- Project management
- Networking and middleware

## Program Information

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

- Prerequisite Phase
- Foundation Phase
- Advanced Phase
- Capstone 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.

After the Prerequisite Phase, the student will complete 13 graduate level courses to meet degree requirements. In the Foundation Phase, a student will follow a sequence of courses to acquire an understanding of the technological and theoretical foundations for the particular degree. In the Advanced Phase of the program, the fundamental information learned previously allows a student to study advanced topics within their chosen competencies. The student completes eight courses during this phase, adding depth to the work completed in the Foundation Phase. Individual interests and needs are also addressed through a series of elective courses chosen in consultation with the students faculty advisor. The student finishes the MS program with ECT 589 E-Commerce Technology Capstone or ECT 590 E-Business Technology Practicum

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## Course Requirements

### ***Prerequisite Phase***

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

CSC 211      Programming in Java I [Self Placement Test Available](#)  
 and CSC 212 Programming in Java II  
 or CSC 224 \* Java for Programmers [Self Placement Test Available](#)  
 or CSC 396    Programming in Java I and II  
 ECT 310      Internet Application Development  
 SE 325       Principles and Practices of Software Engineering [Self Placement Test Available](#)  
 CSC 383      Data Structures and Algorithms in Java

\* CSC 224 is equivalent to the combination of 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 MyCDM.

### ***Foundation Phase***

The Foundation Phase courses for the MS in E-Commerce Technology are:

ECT 425 Technical Fundamentals of Distributed Information Systems  
ECT 455 E-Commerce Web Site Engineering  
CSC 451 Database Design  
or CSC 453 Database Technologies  
SE 430 Object-Oriented Modeling

Fully admitted students in the Foundation Phase may register for a maximum of four Advanced Phase courses.

## ***Advanced Phase***

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

*Required* ( 3 courses) (Notes: 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 career goals and preferences.

Students can fulfill these electives by taking courses in:

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

## ***E-Commerce Competency Modules***

[mn] *IT Management-Oriented*

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

[in] *Internet-Oriented*

in1. Internet Application Development  
in2. Wireless/Mobile Applications

[dd] *Design/Development-Oriented*

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

[do] *Data-Oriented*

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

[if] Infrastructure-Oriented

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

**Competency Module/Course Cross-listing**

[mn] IT Management-Oriented

**mn1. IT Project Management I**

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

**mn2. IT Project Management II**

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

**mn3. IT Planning and Global Strategies**

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

**mn4. Legal & Social Issues**

- ECT 585 Legal Aspects of E-Commerce

IS 433 Information Security Management  
IS 482 Legal Aspects of Information Technology  
IS 511 Social Issues of Computing  
IS 565 IT Outsourcing  
IS 570 Enterprise System Implementation  
IT 599 Topics in Global Information Technology  
TDC  
569 Telecommunication Regulation, Policy, Law and Standards

**mn5. IT Regulatory Compliance**

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

**[in] Internet-Oriented**

**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-BUbusiness 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  
CSC 540 Software Development for Mobile and Wireless Systems

**[dd] Design/Development Oriented**

**dd1.** Application Development  
ECT 455 E-Commerce Web Site Engineering  
ECT 557 Peer-To-peer Technolog  
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 and Quality Assurance  
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 450 Object-Oriented Software Development  
SE 452 Object-Oriented Enterprise Computing  
SE 470 Software Development Processes  
SE 480 Software Architecture  
SE 482 Requirements Engineering  
SE 529 Software Risk Management  
SE 550 Distributed Software Development

**dd3.** e-Business Systems

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

**dd4.** HCI Methods

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

**dd5.** Enterprise Systems Integration

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

[do] Data Oriented



**do1.** Database Design I

CSC 453 Database Technologies  
CSC 451 Database Design  
CSC 452 Database Programming  
CSC 454 Database Administration and Management  
IS 549 Data Warehousing and Data Mining

**do2.** Database Design II

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

**do3.** Data Mining & Analytics

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

**do4.** Knowledge Management

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

**[if] Infrastructure Oriented**

**if1.** Network Design

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

**if2.** Information Assurance & Security Design

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

**if3.** IT Architecture Design  
CSC 551 Distributed Database Systems  
DS 520 System Design and Implementation with Distributed Object Frameworks  
ECT 556 Enterprise Architecture and Design  
ECT 565 Mobile Enterprise  
ECT 590 E-Business Technology Practicum  
IS 535 Information Technology Investment Financial Analysis  
IS 556 Enterprise Project Management  
SE 450 Object-Oriented Software Development  
SE 473 Security Architecture I  
SE 480 Software Architecture  
SE 554 Enterprise Component Architecture  
TDC 463 Computer Networks and Data Systems  
TDC 567 Telecommunication Systems Design and Management

### *Advanced Elective Restrictions*

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

### **Capstone Phase**

The Capstone course for the MS in E-Commerce Technology is:

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

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### **Program, Grade and GPA Requirements**

The MS in E-Commerce Technology Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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.

## Master of Science in Human-Computer Interaction

College of Computing and Digital Media - Graduate Studies □ School of Computing (SoC) □ Master of Science in Human-Computer Interaction

### **Requirements**

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

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

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

### **Program Information**

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

- Prerequisite Phase
- Foundation Phase
- Advanced Phase
- Electives Phase
- Capstone Phase

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 Foundation courses offer knowledge in the multiple disciplines that contribute to HCI. Students in the Foundation Phase acquire an understanding of the technological and theoretical foundations, and the Advanced and Electives Phases provide students the opportunity to study specialized topics in greater depth. These phases add depth to the work completed in the previous phases. The degree culminates in the experience of the Capstone Course where students undertake a comprehensive project involving analysis, design, implementation and evaluation.

### **Course Requirements**

#### **Prerequisite Phase**

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

IT 130	The Internet and the Web <a href="#">Self Placement Test</a>
IT 223	Data Analysis <a href="#">Self Placement Test</a>
IM 230	Scripting for Interactive Media
or IM 336	Interactive Media Scripting for Programmers
IM 270	User-Centered Web Design
HCI 402	Foundations of Digital Design *

\* HCI 402 is not currently offered online. Consult your advisor for determining suitable alternative coursework.

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 MyCDM.

## Foundation Phase

Students should complete their Prerequisite courses before beginning the Foundation courses. However, while completing the Prerequisite courses, students may take Foundation courses with consent of their advisor.

The Foundation courses for the MS in Human-Computer Interaction are:

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

## Advanced Phase

Students must complete all Prerequisite courses and should be finishing Foundation courses before taking Advanced courses.

The Advanced courses are:

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

## Electives Phase

Students must complete five elective courses. Four of these courses should come from the approved lists below. The fifth course can be an advisor-approved elective from the College of CDM. All Electives Phase courses in CDM must be numbered 420 or higher.

The HCI offerings include:

HCI 422	Multimedia
HCI 432	User-Centered Web Development
HCI 511	Designing for Disabilities
HCI 521	Designing for Content Management Systems
HCI 530	Usability Issues for Handheld Devices
HCI 590	Topics in Human-Computer Interaction

Non-HCI Electives open to all HCI graduate students

CSC 423	Data Analysis and Regression
CSC 424	Advanced Data Analysis
CSC 428	Data Analysis for Experimenters
CSC 449	Database Technologies
CSC 451	Database Design
CSC 587	Cognitive Science
ECT 433	Survey of Web Programming Technologies
ECT 455	E-Commerce Web Site Engineering
ECT 480	Intranets and Portals
ECT 586	Customer Relationship Management Technologies
IS 456	Knowledge Management Systems
IS 511	Social Issues of Computing
IS 570	Enterprise System Implementation
ITS 427	Learning and Technology
ITS 431	Instructional Delivery and Course Management Systems
ITS 560	Training and User Support
IT 432	Web Architecture for Non-Programmers

PM 430	Fundamentals of IT Project Management
PM 440	Collaborative Technologies for Leading Projects
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 Organization Psychology
SE 477	Software and Systems Project Management
SE 482	Requirements Engineering

Non-HCI Electives open to HCI students with programming experience.

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

### Capstone Phase

Students must complete the following course:

HCI 594	Human-Computer Interaction Capstone *
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\* HCI 594 is not currently offered online. Consult your advisor for determining suitable alternative course work.

### Program, Grade and GPA Requirements

The MS in Human-Computer Interaction Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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.

## Master of Science in Information Systems

College of Computing and Digital Media - Graduate Studies ▢ School of Computing (SoC) ▢ Master of Science in Information Systems

### Requirements

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

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

Today organizations expect IS professionals to be familiar with a variety of information technology solutions as well as business disciplines. This program helps students attain

multiple competencies as IS professionals when information technology solutions are constantly evolving.

FIND OUT MORE AT THE INFORMATION SYSTEMS PROGRAMS WEBSITE:

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

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

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

### **Competency Modules**

Nineteen Competency Modules are available to allow students to focus in-depth on a variety of information systems areas. Students can choose competency modules that best meet their career plans and can gain expertise in managing technology while enhancing specific technical skills:

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

### **Program Information**

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

- Prerequisite Phase
- Foundation Phase
- Advanced Phase
- Capstone 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.

After the Prerequisite Phase, the student will complete 13 graduate level courses to meet degree requirements. In the Foundation Phase, a student will follow a sequence of courses to acquire an understanding of the technological and theoretical foundations for the particular degree. In the Advanced Phase of the program, the fundamental information learned previously allows a student to study advanced topics within their chosen competencies. The student completes eight courses during this phase, adding depth to the work completed in the Foundation Phase. Individual interests and needs are also addressed through a series of

elective courses chosen in consultation with the students faculty advisor. The student finishes the MS program with IS 577 Information Systems Capstone.

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## **Course Requirements**

### ***Prerequisite Phase***

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

\* Two quarters of a single programming language or equivalent. Students who are interested in taking SE courses are advised to take CSC 211 and CSC 212.

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

ECT 310      Internet Application Development

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

### ***Foundation Phase***

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

IS 425      Enterprise Information

CSC 451      Database Design

ECT 425      Technical Fundamentals of Distributed Information Systems

SE 430      Object Oriented Modeling \*\*

or IS 435      Organizational Modeling

\*\* Students pursuing a degree with a technical focus are encouraged to take SE 430.

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

### ***Advanced Phase***

During the Advanced Phase the student will complete eight elective courses, at least three of which must be 500-level courses.

The Advanced Phase is designed to meet a students career goals in Information Systems. With numerous predefined competency modules, a student can gain expertise in more than one area.

A student should pick competencies based on career goals and preferences. For example, a student can pick Application Development and Project Management I for a career as project manager, can pick Project Management I and Project Management II for a Project Management Office executive, or can pick E-Business Systems and Enterprise Systems Integration for a career as a web enterprise systems integrator.

There are two choices open to a student:

- The student may attain two or more competencies, by taking at least four courses listed under each competency module. Because some courses, such as IS 556

(enterprise project management), are shared by several modules, it is possible to attain more than two competencies.

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

### ***Information Systems Competency Modules***

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

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

#### **[ba] Business Analysis**

#### **[ in] Internet-Oriented**

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

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

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

#### **[do] Data-Oriented**

- do1. Database Design and Management
- do2. Database Implementation
- do3. Data Mining & Analytics
- do4. Knowledge Management

#### **[if] Infrastructure-Oriented**

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

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### ***Competency Module/Course Cross-listing***

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

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

- IS 483 Information Services and Operations
- IS 440 Collaborative Technologies for Leading Projects
- IS 535 Information Technology Investment Financial Analysis
- IS 556 Enterprise Project Management
- IS 560 Enterprise Systems
- IS 570 Enterprise System Implementation
- IS 485 Requirements Elicitation, Analysis, and Specification
- SE 433 Software Testing and Quality Assurance
- SE 468 Software Measurement/Project Estimation
- IS 430 Fundamentals of IT Project Management
- or
- SE477 Software and Systems Project Management
- ACC 500 Financial Accounting (Kellstadt Graduate School of Business)
- MGT 500 Managing Effective and Ethical Organizational Behavior (Kellstadt Graduate School of Business)

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

- ECT 556 Enterprise Architecture and Design
- ECT 589 E-Commerce Technology Capstone



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

**mn3. IT Planning and Global Strategies**

ECT 556 Enterprise Architecture and Design  
ECT 565 Mobile Enterprise  
ECT 589 E-Commerce Technology Capstone  
IS 483 Information Services and Operations  
IS 440 Collaborative Technologies for Leading Projects  
IS 535 Information Technology Investment Financial Analysis  
IS 540 Global Information Technology  
IS 560 Enterprise Systems  
IS 577 Information Systems Capstone  
IT 599 Topics in Global Information Technology  
ACC 500 Financial Accounting (Kellstadt Graduate School of Business)  
MGT  
501 Strategic Supply Chain Management (Kellstadt Graduate School of Business)

**mn4. Legal & Social Issues**

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

**mn5. IT Regulatory Compliance**

CNS 477 Legal Issues in Information Assurance  
IS 433 Information Security Management  
IS 505 Business Continuity and Disaster Recovery  
IS 506 Business Continuity/Disaster Recovery Management and Tactics  
IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance  
IS 535 Information Technology Investment Financial Analysis  
IS 556 Enterprise Project Management  
IS 560 Enterprise Systems

**[ba] Business Analysis**

IS 485 Requirements Elicitation, Analysis, and Specification (required)  
HCI 445 Inquiry Methods and Use Analysis  
IS 435 Organizational Modeling  
HCI 440 Usability Engineering  
PM/ IS 430 Fundamentals of IT Project Management  
IS 570 Enterprise System Implementation

**[in] Internet-Oriented**

**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  
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  
CSC 540 Software Development for Mobile and Wireless Systems

**[dd] Design/Development Oriented**

**dd1. Application Development**

ECT455 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 and Quality Assurance  
SE 470 Software Development Processes  
IS 485 Requirements Elicitation, Analysis and Specification  
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  
IS 485 Requirements Elicitation, Analysis and Specification  
SE 529 Software Risk Management

**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  
IS 535 Information Technology Investment Financial Analysis  
IS 556 Enterprise Project Management

IS 560 Enterprise Systems  
IS 565 IT Outsourcing  
IS 570 Enterprise System Implementation  
MGT 501 Strategic Supply Chain Management (Kellstadt Graduate School of Business)  
MKT 555 Decisions in Marketing Management (Kellstadt Graduate School of Business)

**dd4. HCI Methods**

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

**dd5. Enterprise Systems Integration**

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

**[do] Data Oriented**

**do1. Database Design and Management**

CSC 452 Database Programming  
CSC 454 Database Administration and Management  
IS 549 Data Warehousing and Data Mining  
IS 433 Information Security Management  
CSC 554 Advanced Database Management

**do2. Database Implementation**

CSC 453 Database Technologies  
CSC 543 Spatial Databases and Geographic Information Systems  
CSC 549 Database System Implementation  
CSC 551 Distributed Database Systems  
CSC 553 Advanced Database Concepts

**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 Business Intelligence  
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 440 Collaborative Technologies for Leading Projects  
IS 574 Business Intelligence  
IS 575 Intelligent Information Retrieval

**[if] Infrastructure Oriented**

**if1. Network Design**

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

**if2. Information Assurance & Security Design**

CNS 477 Legal Issues in Information Assurance  
CNS 594 Computer Information and Network Security Capstone  
ECT 582 Secure Electronic Commerce  
IS 433 Information Security Management  
IS 505 Business Continuity and Disaster Recovery  
IS 506 Business Continuity/Disaster Recovery Management Tactics  
IS 511 Social Issues of Computing  
IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance  
SE 525 Software Security Architecture  
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  
ECT 556 Enterprise Architecture and Design  
ECT 565 Mobile Enterprise  
IS 535 Information Technology Investment Financial Analysis  
IS 556 Enterprise Project Management  
SE 435 Distributed Systems I  
SE 450 Object-Oriented Software Development  
SE 525 Software Security Architecture  
SE 480 Software Architecture  
SE 536 Distributed Systems II  
SE 554 Enterprise Component Architecture  
TDC 463 Computer Networks and Data Systems  
TDC 567 Telecommunication Systems Design and Management

**Capstone Phase**

The Capstone course for the MS in Information Systems is:

IS 577 Information Systems Capstone

**Advanced Elective Restrictions**

Elective courses are in the range of 420-699 and must be from the College of CDM. Credit for

courses taken outside of the school will only be given if approved by a faculty advisor. Courses suggested for any Prerequisite Phase in any concentration do not count for elective credit. Any course required for the students concentration but taken as part of the requirements of another degree earned by the student may be used to satisfy a competency, but cannot be used to satisfy the eight elective course requirement.

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### **Program, Grade and GPA Requirements**

The MS in Information Systems Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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.

## Master of Arts in Information Technology

College of Computing and Digital Media - Graduate Studies ▢ School of Computing (SoC) ▢ Master of Arts in Information Technology

### **Requirements**

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

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

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

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

The **Master of Arts in Information Technology Program** includes four phases:

- Prerequisite Phase
  - Foundation Phase
  - Advanced Phase
  - Capstone
- 

Required Courses

### **Prerequisite Phase**

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

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

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

### **Foundation Phase**

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

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

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

### **Advanced Phase**

The Advanced Phase provides opportunities for breadth and depth in IT, and allows for specialized interests through five elective courses. Suggested elective courses are listed below. Two of the five elective courses must be taken at the 500 level.

#### **Suggested Electives**

CSC 424 Advanced Data Analysis  
CSC 428 Data Analysis for Experimenters  
CSC 449 Database Technologies  
ECT 480 Intranets and Portals  
ECT 556 Enterprise Architecture and Design  
ECT 565 Mobile Enterprise  
ECT 585 Legal Aspects of E-Commerce  
ECT 586 Customer Relationship Management Technologies  
ECT 589 E-Commerce Technology Capstone  
HCI 450 Foundations of Human-Computer Interaction  
HCI 454 Interaction Design  
HCI 460 Usability Evaluation Methods  
IPD 499 Topics in Global Information Technology  
IS 425 Enterprise Information  
IS 570 Enterprise System Implementation.  
IS 456 Knowledge Management Systems  
IS 482 Legal Aspects of Information Technology  
IS 483 Information Services and Operations  
IS 505 Business Continuity and Disaster Recovery  
IS 512 Collaborative Technologies for Leading Projects  
IS 540 Global Information Technology  
IS 560 Enterprise Systems

IS 433 Information Security Management  
IS 577 Information Systems Capstone  
IS 578 Information Technology Consulting  
IS 596 Topics in Information Systems  
ITS 560 Training and User Support  
SE 430 Object Oriented Modeling  
SE 477 Software and Systems Project Management  
TDC 463 Computer Networks and Data Systems  
TDC 464 Voice Communication Networks  
TDC 476 Economics of Telecommunication Systems  
TDC 511 Telecommunications Practicum  
TDC 569 Telecommunication Regulation, Policy, Law and Standards

### **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.

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### **Program, Grade and GPA Requirement**

The MA in Information Technology consists of a minimum of 52 hours ( typically 13 courses) not including required prerequisite courses.

**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.

## **Master of Science in IT Project Management**

College of Computing and Digital Media - Graduate Studies ▫ School of Computing (SoC) ▫ Master of Science in IT Project Management

### **Requirements**

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

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

Over the past decade, it has become apparent that placing individuals with strong training in the breadth of project management skills significantly improves the likelihood of bringing an

IT project in successfully on time, and on budget.

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

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

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

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

### **Program Information**

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

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

- Foundation Phase
- Advanced Phase
- Capstone

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## **Required Coursework**

### ***Foundation Phase***

The following courses are required:

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

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

### ***Advanced Phase***

Twenty-four quarter hours are required from the following list, with a minimum of twelve of these quarter hours taken from CDM. These electives cover a broad range of technical,



managerial, and information systems topics. Students should work closely with their advisor to identify and select courses most directly associated with their career plans.

*CDM Electives* (all 4 quarter hours)

IS 433 Information Security Management  
IS 456 Knowledge Management Systems  
IS 483 Information Technology Operations and Services  
IS 505 Business Continuity/Disaster Recovery Theories and Strategies  
IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance  
IS 540 Global Information Technology  
IS 560 Enterprise Systems  
IS 565 Information Technology Outsourcing  
IS 578 Information Technology Consulting  
SE 427 Software Quality Management  
SE 430 Object Oriented Modeling \*  
SE 468 Software Measurement/Project Estimation  
SE 470 Software Development Processes  
SE 482 Requirements Engineering  
SE 529 Software Risk Management

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

*Kellstadt Electives* (all 4 quarter hours)

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

*SNL Electives* (3 quarter hours)

SNL 745 Improving Interpersonal Dynamics  
SNL 755 Valuing Human Differences Seminar  
SNL 765 Engaging Ethical Reasoning Seminar

*SNL Special Topics Seminars* (1 quarter hour)

SNL 598 Special Topics

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

**Capstone** (4 quarter hours)

PM 577 Project Management Practicum Capstone

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**Program, Grade and GPA Requirements**

The MS in IT Project Management Program consists of 52 hours (typically 13 courses) not including required prerequisite courses.

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

## Master of Science in Software Engineering

College of Computing and Digital Media - Graduate Studies ▢ School of Computing (SoC) ▢ Master of Science in Software Engineering

### Requirements

The **Master of Science in Software Engineering** at DePaul CDM provides students with skills that are widely applicable, highly in demand and richly rewarded. Software engineering is a discipline concerned with the processes, methodologies, techniques, and tools of developing high-quality software systems in a cost-effective manner. The Software Engineering program emphasizes the best software engineering practices, current methodologies, emerging technologies, and their applications. It also emphasizes the development of communication and presentation skills in a team-based software development environment.

The Software Engineering curriculum encompasses all important aspects of software engineering, including:

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

The Software Engineering program provides students with highly marketable skills and knowledge in state-of-the-art software engineering methodologies, techniques, and applications.

### Concentrations

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

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

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

The **Gaming and Entertainment Technologies Concentration** addresses the foundations, methodologies, and tools for developing large-scale computer games and entertainment software systems.

### What Students Learn From the Program

- Technical foundations in object-oriented analysis, modeling, architecture, design, and construction

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

## Program Information

The Software Engineering program consists of four phases:

- Prerequisite Phase
- Foundation Phase
- Advanced Phase
- Major Electives
- Open Electives

The program also offers a Thesis option as an alternative to the Capstone Phase.

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## Course Requirements

### ***Software Development Concentration***

#### Prerequisite 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.

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

#### Foundation Phase

SE 430 Object Oriented Modeling  
 SE 433 Software Testing and Quality Assurance  
 SE 450 Object-Oriented Software Development  
 SE 477 Software and Systems Project Management

#### Advanced Phase

CSC 435            Distributed Systems I  
 SE 480            Software Architecture  
 SE 554            Enterprise Component Architecture

#### Capstone Project

The following two courses must be taken 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

SE 491            Software Engineering Studio  
 SE 591            Software Engineering Studio II

## Major Electives (3 courses)

- any SE courses or from the SE Elective list below
- at least 2 SE courses

## Open Electives(1 course)

- One open elective: any graduate course from the School of Computing (SoC) subject to the following restriction.

### Elective Course Restrictions

Elective courses are in the range of 420-699, and must be from the College of CDM. Credit for courses taken outside 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.

## Program, Grade and GPA Requirements

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

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

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### ***Software Architecture Concentration***

#### Prerequisite 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.

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

#### Foundation Phase

SE 430 Object Oriented Modeling  
SE 433 Software Testing and Quality Assurance  
SE 450 Object-Oriented Software Development  
SE 477 Software and Systems Project Management

#### Advanced Phase

SE 457 Service Oriented Architecture  
SE 480 Software Architecture  
SE 482 Requirements Engineering

#### Capstone Project

The following two courses must be taken 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

SE 491                Software Engineering Studio  
SE 591                Software Engineering Studio II

Major Electives (3 courses)

- any SE courses or from the SE Elective list below
- at least 2 SE courses

Open Electives(1 course)

- One open elective: any graduate course from the School of Computing (SoC) subject to the following restriction.

#### Elective Course Restrictions

Elective courses are in the range of 420-699, and must be from the College of CDM. Credit for courses taken outside 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.

### **Program, Grade and GPA Requirements**

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

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

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### ***Project Management Concentration***

Prerequisite 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.

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

Foundation Phase

SE 430 Object Oriented Modeling  
SE 433 Software Testing and Quality Assurance  
SE 450 Object-Oriented Software Development  
SE 477 Software and Systems Project Management

Advanced Phase

SE 468            Software Measurement/Project Estimation  
SE 482            Requirements Engineering

## Capstone Project

The following two courses must be taken 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

SE 491 Software Engineering Studio  
SE 591 Software Engineering Studio II

## Major Electives (3 courses)

- any SE courses or from the SE Elective list below
- at least 2 SE courses

## Open Electives(1 course)

- One open elective: any graduate course from the School of Computing (SoC) subject to the following restriction.

### Elective Course Restrictions

Elective courses are in the range of 420-699, and must be from the College of CDM. Credit for courses taken outside 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.

## Program, Grade and GPA Requirements

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

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

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## ***Gaming and Entertainment Technologies Concentration***

### Prerequisite 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.

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

### Foundation Phase

SE 430 Object Oriented Modeling  
SE 433 Software Testing and Quality Assurance  
SE 450 Object-Oriented Software Development

## SE 477 Software and Systems Project Management

### Advanced Phase

SE 456	Architecture of Computer Games
SE 558	Architecture and Design for Multiplayer Games
GAM 475	Game Engine Programming I

### Capstone Project

The following two courses must be taken 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

SE 491	Software Engineering Studio
SE 591	Software Engineering Studio II

### Major Electives (3 courses)

- any SE courses or from the SE Elective list below
- at least 2 SE courses

### Open Electives(1 course)

- One open elective: any graduate course from the School of Computing (SoC) subject to the following restriction.

### Elective Course Restrictions

Elective courses are in the range of 420-699, and must be from the College of CDM. Credit for courses taken outside 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.

### **SE Elective List**

#### Enterprise Software Development

SE 452 Object-Oriented Enterprise Computing  
SE 554 Enterprise Component Architecture  
SE 453 Architecture and Frameworks for Developing Client Applications  
SE 470 Software Development Processes  
SE 482 Requirements Engineering  
SE 533 Software Validation and Verification  
SE 560 Structured Documentation Interchange and Processing  
CSC 438 Framework for Web Application Development  
CSC 453 Database Technologies

#### Software Architecture

SE 457 Service-Oriented Architecture  
SE 480 Software Architecture  
SE 456 Architecture of Computer Games  
SE 549 Model-Driven Software Development  
SE 558 Architecture and Design for Multiplayer Games

#### Computer Security

CNS 450 Computer Forensics  
SE 525 Software Security Architecture  
SE 526 Software Security Assessment  
CSC 439 Computer Security

#### Distributed Systems

CSC 435 Distributed Systems I  
CSC 536 Distributed Systems II  
CSC 552 Concurrent Software Development  
SE 558 Architecture and Design for Multiplayer Games

### Project Management

SE 468 Software Measurement/Project Estimation  
SE 470 Software Development Processes  
SE 511 Practices of Global Software Development  
SE 529 Software Risk Management  
IS 556 Enterprise Project Management  
IS 535 Information Technology Investment Financial Analysis  
IS 533 Enterprise Security Infrastructure Controls and Regulatory Compliance  
IS 565 IT Outsourcing  
IS 560 Enterprise Systems

### User Centered Development

HCI 440 Usability Engineering  
HCI 430 Architecture and Frameworks for Developing  
SE 453 Architecture and Frameworks for Developing Client Applications  
SE 546 Software Architecture and Design for Desktop Applications

### Programming Languages & Compiler

SE 533 Software Validation and Verification  
CSC 447 Concepts of Programming Languages  
CSC 448 Compiler Design  
CSC 548 Advanced Compiler Design  
CSC 535 Formal Semantics of Programming Languages

### Gaming and Entertainment Technology

SE 456 Architecture of Computer Games  
SE 558 Architecture and Design for Multiplayer Games  
GAM 453 Tool Programming for Game Development  
GAM 475 Game Engine Programming I  
GAM 490 Multiplayer Game Development  
GAM 575 Game Engine Programming II

### Software Engineering Research

Students taking the research option must take the following course:

SE 690 Research Seminar

Students must also complete one of the following:

SE 696 Master's Project

or SE 698 Master's Thesis

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.

## **Program, Grade and GPA Requirements**

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

- Students must receive a grade of B- or better in each prerequisite course and a C- or better in all other courses.
- Students must maintain a graduate level GPA of 2.50 or higher while pursuing their degree.



- Students will not be approved for graduation with less than a 2.50 GPA.
- Students with a GPA of 3.9 or higher will graduate with distinction.

SE At-A-Glance

College of Computing and Digital Media - Graduate Studies ▢ School of Computing (SoC) ▢ Master of Science in Software Engineering ▢ SE At-A-Glance

**SE At-A-Glance**

**MS Software Engineering At-A-Glance (AY 2010)**

Concentrations in *Software Development*, *Software Architecture*, *Project Management* and *Gaming and Entertainment Technologies*

See Requirements page for prerequisite course requirements and additional information about MS Software Engineering program.

Software Development	Software Architecture	Project Management	Gaming and Entertainment Tech.
<b>Foundation Courses (4)</b>			
SE430 Object Oriented Modeling			
SE433 Software Testing and Quality Assurance			
SE450 Object Oriented Software Development			
SE477 Software & Systems Project Management			
<b>Required Courses in Concentration (3)</b>			
CSC435 Foundations of Distributed Systems I	SE457 Service-Oriented Architecture	SE468 Software Measurement and Project Estimation	SE456 Architecture of Computer Games
SE480 Software Architecture	SE480 Software Architecture	SE482 Requirements Engineering	SE558 Architecture and Design for Multiplayer Games
SE554 Enterprise Component Architecture	SE482 Requirements Engineering	SE511 Practices of Global Software Development	GAM475 Game Engine Programming I
<b>SE Capstone Project (2)</b>			
SE491 & SE591 Software Engineering Studio 1 & 2			
<b>SE Electives (3 from the following)</b>			
<b>Enterprise Software Development:</b> SE452 SE554 SE453 SE470 SE482 SE533 SE560 CSC438 CSC453		<b>Programming Languages &amp; Compiler:</b> SE533 CSC447 CSC448 CSC548 CSC535	
<b>Software Architecture:</b> SE457 SE480 SE456 SE549 SE558		<b>Gaming and Entertainment Tech:</b> SE456 SE558 GAM453 GAM475 GAM490 GAM575	
<b>Computer Security:</b> CNS450 SE525 SE526 CSC439		<b>User Centerd Development:</b> HCI440 HCI430 SE453 SE546	
<b>Distributed Systems:</b> CSC435 CSC536 CSC552 SE558		<b>Software Engineering Research:</b> SE690 and (SE696 or SE698)	
<b>Project Management:</b> SE468 SE470 SE511 SE529 IS556 IS535 IS533 IS565 IS560			
<b>SoC Open Elective (1)</b>			
One graduate course in the School of Computing			

*Distinction requirements: GPA 3.9 or higher*

# Master of Science in Telecommunications Systems

College of Computing and Digital Media - Graduate Studies ▫ School of Computing (SoC) ▫ Master of Science in Telecommunications Systems

## Requirements

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

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

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

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

## What Students Learn From The Program

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

## Program Information

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

- **Prerequisite Phase**
- **Foundation Phase**
- **Advanced Phase**

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

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## Course Requirements

### Prerequisite Phase

The Prerequisite Phase courses for the MS in Telecommunications are:

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

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

or any more advanced programming course

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

TDC 311 Computers in Telecommunications Systems

or CSC 373 Computer Systems I

TDC 361 Basic Communication Systems

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

### Foundation Phase

The Foundation Phase courses for the MS in Telecommunications are:

TDC 460 Foundations of Communications Systems

TDC 463 Computer Networks and Data Systems

TDC 464 Voice Communication Networks

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

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

### 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.

#### *Required Courses*

TDC 477 Network Security I

TDC 511 Telecommunications Practicum

TDC 563 Protocols and Techniques for Data Networks

and four TDC courses from the range TDC 430 to TDC 599, where at least three are numbered above 500.

#### *Open Electives*

Students must also complete three Open Electives. Elective courses must not have been

otherwise used to satisfy degree requirements. Open Elective Courses are in the range of 420-699 (excluding TDC 425) and must be from the College of CDM. 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.

### **Program, Grade and GPA Requirements**

The MS in Telecommunications Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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.

## Juris Doctorate and Master of Arts

College of Computing and Digital Media - Graduate Studies ▫ School of Computing (SoC) ▫ Juris Doctorate and Master of Arts

### **About**

The general objective of the joint JD/MA degree program at DePaul University College of Law Center for Intellectual Property Law & Information Technology (CIPLITŽ) and its College of Computing and Digital Media (CDM) 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 CDM masters degree courses, reducing their CDM 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 CDM 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 CDM courses taken after enrollment in the College of Law may be substituted for law courses.
- Joint degree students may not substitute CDM 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/CDM four-year course plan

College of Computing and Digital Media - Graduate Studies □ School of Computing (SoC) □ 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 CDM. Students should indicate their interest in the joint degree program when applying to CDM.

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 CDM may be made at any time, but law students will ordinarily find it most advantageous to apply to CDM 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

CDM 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 CDM to discuss their individual circumstances before applying to CDM.

Transfer students or students who have enrolled in CDM 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 CDM
- 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

College of Computing and Digital Media - Graduate Studies □ School of Computing (SoC) □ Juris Doctorate and Master of Arts □  
Sample Law School/CDM four-year course plan

### **Sample Law School/CDM 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 CDM course Fall Quarter, two CDM courses Winter Quarter, and two CDM courses Spring Quarter. The fourth year might consist of three law courses Fall Semester, one CDM course Fall Quarter, three CDM courses Winter Quarter, and three CDM courses Spring Quarter. This schedule allows for completion of the JD as well as completion of 14 CDM 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 CDM 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 CDM.

#### ***Prerequisite Phase***

The Prerequisite Phase is intended to insure that all students enter CDM 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 CDM 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 CDM 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](mailto:dwhite@depaul.edu) - For questions regarding administrative aspects of the joint degree and College of Law programs
- Professor Katherine Strandburg - College of Law - [kstrandb@depaul.edu](mailto:kstrandb@depaul.edu) - For questions regarding substantive aspects of the College of Law IP and IT programs
- Professor Danny Mittleman CDM - [danny@cdm.depaul.edu](mailto:danny@cdm.depaul.edu) - For questions regarding substantive aspects of the CDM program
- Professor Curt White CDM - [cwhite@cdm.depaul.edu](mailto:cwhite@cdm.depaul.edu) - For questions regarding substantive aspects of the CDM program

## Juris Doctorate and Master of Science

College of Computing and Digital Media - Graduate Studies ▫ School of Computing (SoC) ▫ 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 (CIPLIT<sup>2</sup>) and its College of Computing and Digital Media (CDM) 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 CDM masters degree courses, reducing their CDM 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 CDM 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 CDM courses taken after enrollment in the College of Law may be substituted for law courses.
- Joint degree students may not substitute CDM 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/CDM four-year course plan



## 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 CDM. Students should indicate their interest in the joint degree program when applying to CDM.

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 CDM may be made at any time, but law students will ordinarily find it most advantageous to apply to CDM after receiving first-year law grades (ordinarily in early July following the first year.) Students must declare a specific MS degree upon application to CDM and meet the CDM 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 CDM to discuss their individual circumstances before applying to CDM.

Transfer students or students who have enrolled in CDM 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 CDM
- 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

College of Computing and Digital Media - Graduate Studies ▫ School of Computing (SoC) ▫ Juris Doctorate and Master of Science ▫ Sample Law School/CDM four-year course plan

### Sample Law School/CDM 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 CDM course Fall Quarter, two CDM courses Winter Quarter, and two CDM courses Spring Quarter. The fourth year might consist of three law courses Fall Semester, one CDM course Fall Quarter, three CDM courses Winter Quarter, and three CDM courses Spring Quarter. This schedule allows for completion of the JD as well as completion of 14 CDM 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 CDM 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 CDM.

### **CDM Requirements for an MS Degree**

For the CDM 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 CDM website. These requirements are divided into the phases. Upon completion of those requirements, each student will move to the Elective Phase as described below.

### **Electives**

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

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

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

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

## **Advanced Software Development Professional**

College of Computing and Digital Media - Graduate Studies ▫ School of Computing (SoC) ▫ 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, CDM 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 (CSDPŽ) 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 CDM 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 CSDP certification, and must then earn 30 Professional Development Units, 15 of which may come from College and University courses. Since each CDM course is worth 5.2 PDUs, three CDM courses will earn those 15 PDUs. CSDP recertification is required every three years, and so one CDM 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 CDM 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 CSDP recertification is for informational purposes only. This document may not reflect the most recent requirements for CSDP recertification.*



# School of Cinema and Interactive Media (CIM)

College of Computing and Digital Media - Graduate Studies □ School of Cinema and Interactive Media (CIM)

## About the School

The School of Cinema and Interactive Media (CIM) houses CDM's creative degrees. With an emphasis on all aspects of production, students can earn degrees that prepare them for work in cinema, animation, computer game development and interactive media.

College of Computing and Digital Media - Graduate Studies □ School of Cinema and Interactive Media (CIM) □ Faculty

## Faculty

LISA BARCY, M.A.  
Instructor  
Columbia College

ROBIN BURKE, Ph.D.  
Associate Professor  
Northwestern University

SHAYNA CONNELLY, M.F.A.  
Instructor  
Columbia College

RONALD ELTANAL, M.F.A.  
Visiting Associate Professor  
University of Southern California

SCOTT ERLINDER, M.F.A.  
Assistant Professor  
Columbia College

DANA HODGDON, M.A.  
Visiting Professor  
Northwestern University

MATT IRVINE, M.F.A.  
Assistant Professor  
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JOSHUA JONES, M.F.A .  
Assistant Professor  
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STEVEN JONES, B.S.  
Producer in Residence  
Illinois Institute of Technology

EDWARD KEENAN, M.S.  
Instructor  
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University of Southern California

JOSEPH LINHOFF, J.D.  
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WILLIAM MUEHL, B.A.  
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GARY NOVAK, M.F.A.  
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## Master of Science in Computer Game Development

College of Computing and Digital Media - Graduate Studies □ School of Cinema and Interactive Media (CIM) □ Master of Science in Computer Game Development

### Requirements

The **MS in Computer Game Development** is designed for those interested in game development programming at the highest level, including computer science and computer graphics

professionals retooling for the game industry.

This degree program consists of:

- Prerequisite Phase
- Foundation Phase
- Advanced Phase
- Major Electives
- Open Electives
- Capstone

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## Course Requirements

### ***Prerequisite Phase***

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

CSC 261 Programming Languages I: C/C++  
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  
or CSC 393 Data Structures in C++  
GPH 321 Computer Graphics Development  
or a linear algebra equivalent  
MAT 150 Calculus I

Evaluation of prerequisite competencies will follow standard CDM practice: 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. 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 by logging in to MyCDM.

### ***Foundation Phase***

The Foundation Phase provides a common foundation in computer game development. Students are required to complete these courses before moving to the Advanced Phase.

GAM 424 Game Design Workshop  
GAM 474 Action Games Programming  
GAM 475 Game Engine Programming I

### ***Advanced Phase***

The Advanced Phase provides specialized knowledge in computer game development topics, as well as allowing students to choose a particular emphasis for their studies.

Students must successfully complete the following courses:

GAM 450 Physics for Game Developers  
GAM 476 Artificial Intelligence for Computer Games  
CSC 421 Applied Algorithms and Structures  
GPH 469 Computer Graphics Development  
GAM 575 Game Engine Programming II

## **Major Electives**

Students must also successfully complete two courses from the following list of Major Electives:

CSC 443 Introduction to Operating Systems  
CSC 447 Concepts of Programming Languages  
CSC 448 Compiler Design  
CSC 451 Database Design  
CSC 480 Foundations of Artificial Intelligence  
CSC 578 Neural Networks and Machine Learning  
GAM 490 Multiplayer Game Development  
GAM 599 Topics in Computer Game Design and Development  
GPH 438 Computer Animation Survey  
GPH 448 Computer Graphics Scripting  
GPH 539 Advanced Rendering Techniques  
GPH 540 Procedural Shading  
GPH 541 Advanced Lighting Techniques  
GPH 570 Visualization  
GPH 572 Principles of Computer Animation  
GPH 575 Advanced Graphics Development  
SE 430 Object Oriented Modeling  
SE 433 Software Testing and Quality Assurance  
CSC 435 Distributed Systems I  
SE 450 Object-Oriented Software Development  
SE 477 Software and Systems Project Management  
CSC 536 Distributed Systems II  
CSC 534 Software Development for Limited and Embedded Devices  
CSC 552 Concurrent Software Development  
SE 558 Architecture and Design for Multiplayer Games  
or any graduate GAM course

## **Open Electives**

Students must also complete one elective course in the range of 420-699, from any CDM program.

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

## **Capstone**

GAM 690 Game Development Studio I  
GAM 691 Game Development Studio II

Students must register for GAM 690 and GAM 691 in consecutive quarters. A grade will not be assigned for GAM 690 until GAM 691 has been completed.

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## **Program, Grade and GPA Requirements**

The MS in Computer Game Development consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

A grade point average of at least 2.5 (A=4.0) must be maintained in all course work toward the master's degree. Courses in which a grade of C- (1.7) or lower is earned will not apply



toward a graduate degree.

## Master of Science in Computer Graphics and Motion Technology

College of Computing and Digital Media - Graduate Studies □ School of Cinema and Interactive Media (CIM) □ Master of Science in Computer Graphics and Motion Technology

### Requirements

#### ABOUT

The **MS in Computer Graphics and Motion Technology** is a study of the technical and visual foundations for the design and software development of Computer Graphics and Animation. This program prepares students for technical careers in the graphics industry ranging from entertainment to data visualization for science and medicine.

#### What Students Will Learn From The Program

- Gain 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 interaction design, modeling objects, controlling cameras, rigging characters for animation and using particle and surface techniques
- 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
- Become appreciative of the two cultures of computer graphics the one drawing on communication design and the other deriving from computer science.

This degree prepares students for careers in graphics/animation production and software development. Students acquire both the aesthetic and technical knowledge required in this changing industry.

Students can choose from three concentrations, depending on their career aspirations:

- **Developer**
- **Technical Director**
- **Visualization**

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### Developer Concentration

A more traditional computer science path, focusing on the mathematical and programming techniques necessary to build graphics/animation software. Developers study not only the necessary data structures to build software such as game engines and production renderers but also the knowledge required to know what software artists will need and how they will use it.

#### Course Requirements

#### Prerequisite Phase

IT 240	Introduction to Desktop Databases <a href="#">Self Placement Test Available</a>
CSC 261	Programming in C++ I
CSC 262	Programming in C++ II
CSC 393	Data Structures in C++
HCI 402	Foundations of Digital Design
GPH 212	Perceptual Principles for Digital Environments II



take the industrys software as far as it can go in realizing the artists creative intent. Graduates will be able to assist creative directors in such activities as creating virtual sets, adjusting lighting, asset management and rigging characters for animation.

### **Course Requirements**

#### **Prerequisite Phase**

IT 240	Introduction to Desktop Databases <a href="#">Self Placement Test Available</a>
CSC 211	Programming in Java I <a href="#">Self Placement Test Available</a>
<b>and</b> CSC 212	Programming in Java II
<b>or</b> CSC 261	Programming in C++ I
<b>and</b> CSC 262	Programming in C++ II
<b>or</b> CSC 224	Java for Programmers
<b>or</b> CSC 396	Programming in Java I and II
GPH 259	Design Geometry
HCI 402	Foundations of Digital Design
GPH 212	Perceptual Principles for Digital Environments II

The Technical Designer prerequisite concentration requires two quarters of programming in either Java or C/C++ so students entering with prior course work in C++ will satisfy this requirement. Any Technical Designer student who wishes to eventually take courses in the Developer concentration as electives is encouraged to take the C++ programming track CSC 261 and CSC 262 to satisfy the prerequisite programming requirement.

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 an online Change of Status request when the Prerequisites 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 MyCDM.

#### **Foundation Phase**

GPH 425	Survey of Computer Graphics
GPH 438	Computer Animation Survey
GPH 448	Computer Graphics Scripting
HCI 470	Digital Page Formatting I
HCI 440	Usability Engineering
GPH 450	Digital Modeling I

#### **Advanced Phase**

HCI 422	Multimedia
GPH 560	Modeling Spaces
GPH 565	Designing for Visualization
GPH 539	Advanced Rendering Techniques

#### **Major Electives \***

One GPH course 420 level or above

#### **Open Electives \***

Two CDM courses 420 level or above

\* At least one of the above 3 electives must be 500 level or above. Elective courses must not

have been otherwise used to satisfy degree requirements.

### **Suggested Electives**

CSC 421	Applied Algorithms and Structures
CSC 423	Data Analysis and Regression
CSC 482	Applied Image Analysis
CSC 483	Information Processing Management
CSC 521	Monte Carlo Algorithms
GPH 448	Computer Graphics Scripting
GPH 487	Forensic Animation
GPH 536	Smooth Surface Modeling for Graphics and Animation
GPH 540	Procedural Shading
GPH 575	Advanced Graphics Development

### **Program, Grade and GPA Requirements**

The MS in Computer Graphics and Motion Technology Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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 3.9 or higher will graduate with distinction.

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### **Visualization Concentration**

Focuses on graphics/animation for displaying, explaining and analyzing scientific and medical data. Visualization displays numerical data in an accurate, high-density and compact form in which patterns are revealed, emphasized and clearly communicated. Students focus on the mathematics, statistics and programming techniques necessary to analyze and display such data. At the same time students are given a firm grounding in the aesthetics that allow them to build visualizations that communicate effectively and beautifully.

### **Course Requirements**

#### **Prerequisite Phase**

IT 223	Data Analysis
CSC 261	Programming in C++ I
CSC 262	Programming in C++ II
CSC 393	Data Structures in C++
MAT 150	Calculus I
or MAT 160	Calculus for Mathematics and Science Majors I
or MAT 170	Calculus I with Scientific Applications**
MAT 151	Calculus II
or MAT 161	Calculus for Mathematics and Science Majors II
or MAT 171	Calculus II with Scientific Applications**
HCI 402	Foundations of Digital Design

\*\* Recommended

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 an online Change of Status request when the Prerequisites 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 MyCDM.

#### **Foundation Phase**

GPH 425	Survey of Computer Graphics
GPH 436	Fundamentals of Computer Graphics
HCI 440	Usability Engineering
CSC 431	Scientific Computing
HCI 470	Digital Page Formatting I
GPH 469	Computer Graphics Development

#### **Advanced Phase**

GPH 572	Principles of Computer Animation
CSC 481	Introduction to Image Processing
GPH 570	Visualization
GPH 580	Hardware Shading Techniques

#### **Major Electives \***

One GPH course 420 level or above

#### **Open Electives \***

Two CDM courses 420 level or above

\* At least one of the above 3 electives must be 500 level or above. Elective courses must not have been otherwise used to satisfy degree requirements.

#### **Suggested Electives**

GPH 438	Computer Animation Survey
GPH 450	Digital Modeling I
GPH 539	Advanced Rendering Techniques
GPH 560	Modeling Spaces

### ***Program, Grade and GPA Requirements***

The MS in Computer Graphics and Motion Technology Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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 3.9 or higher will graduate with distinction.

# Master of Fine Arts in Digital Cinema

College of Computing and Digital Media - Graduate Studies □ School of Cinema and Interactive Media (CIM) □ Master of Fine Arts in Digital Cinema

## Requirements

The Master of Fine Arts (MFA) in Digital Cinema is the terminal degree in digital filmmaking.

The MFA program is a highly selective program that culminates in the successful completion of the MFA thesis project, a public presentation of the thesis project, and a defense of the thesis to the student's MFA committee.

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.

At any time after completing 7 courses (28 credit hours) toward the MS in Digital Cinema, a student may elect to apply for admission into the MFA program. The steps in applying for admission to the MFA program are as follows:

1. Contact the full-time Digital Cinema faculty member with whom you want to work. This faculty will become Chair of your MFA Committee if you are accepted in the MFA.
2. Work with that faculty member in preparing materials and a timeline for your application.
3. Make a formal MFA Application during the first week of any academic quarter or during the first week of the Summer I session. Your sponsoring faculty member will serve as your advocate during the MFA selection process.

## The MFA Application

### Components of the MFA Application

The MFA application should include:

- a statement of purpose in pursuing the MFA degree, including the faculty member who will be your advocate.
- samples of creative work submitted on DVD.
- a synopsis and production/finishing schedule for the proposed thesis project.

### Submission of the MFA Application

The application should be made to the Chair of the MFA Committee. Applications should be made during the first week of any academic quarter or during the first week of the Summer I session.

### Digital Cinema MFA Committee

The MFA committee will meet every academic quarter (and during the Summer I session) to consider applications for admission to the program. Decisions pertaining to acceptance or rejection into the MFA program will be made only at these meetings. The criteria for admission into the MFA are as follows:

1. The student's creative potential as a film maker.
2. The committee's determination of the student's ability to complete the thesis project.
3. The compatibility of the Digital Cinema MFA program with the student's goals as indicated in the statement of purpose.

Students will be advised of MFA Committee application decisions by the 5th week of the academic quarter (or at the end of the Summer I session). All admission decisions of the MFA Committee are final. Students who are not admitted into the MFA will continue in the MS program.

### Student's MFA Committee

The student's MFA Committee shall have a Chair and a minimum of two other members. The Chair (who was the student's advocate during the selection process) and one committee member must be full-time Digital Cinema Faculty. After assembling an MFA Committee the student will advise the Chair of the Digital Cinema MFA Committee of the composition of that committee. The student will work closely with the Chair of his/her committee in planning and completing the MFA thesis.

### **Course Requirements**

The course requirements for the MFA are as follows:

The thirteen courses required for the MS, plus three MFA thesis seminars.

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

### **The MFA Thesis**

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

- For live action projects, 15-35 minutes.(15-20 minute films tend to get the best festival play). Films longer than 35 minutes usually do not qualify for the SAG student film waiver.
- The Digital Cinema faculty encourages students to produce feature length films.
- For animation projects, 10 minutes or more.

### **The Thesis Screening**

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

### **The MFA Thesis Defense**

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

## Master of Science in Digital Cinema

College of Computing and Digital Media - Graduate Studies □ School of Cinema and Interactive Media (CIM) □ Master of Science in Digital Cinema

### **Requirements**

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

### **Concentrations**

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

The **CINEMA PROGRAM CONCENTRATION** is the advanced study of all aspects of digital

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

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

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

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

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

The **Master of Science in Digital Cinema** degree program consists of three phases:

- Prerequisite Phase
- Foundation Phase
- Advanced Phase

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### ***Cinema Concentration***

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.

#### **Prerequisite Phase**

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

DC 201 Introduction to Screenwriting  
DC 210 Digital Cinema Production I  
DC 215 Digital Sound Design  
DC 220 Editing I  
DC 275 Cinematography and Lighting

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 Foundation Phase of the program. Students may submit the Change of Status request by logging in to MyCDM .

#### **Foundation Phase**

The Foundation Phase is designed to provide a common foundation in digital cinema



production.

DC 460 Digital Cinema Proseminar

DC 461 Production Workshop

DC 462 Production Seminar

### **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.

DC 401 Writing the Short Motion Picture

DC 495 Directing the Short Motion Picture

DC 476 Visual Design

DC 430 Visual Effects

DC 485 Producing the Feature Film

### **Major Electives**

Students in this program must choose any 3 DC or ANI graduate-level courses.

### **Open Electives**

Students must also take 2 graduate-level CDM electives (including DC courses).

### **Program, Grade and GPA Requirements**

The MS in Digital Cinema Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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 this 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

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## ***Animation Concentration***

### **Prerequisite Phase**

ANI 101 Animation for Non-Majors or ANI 201 Animation I

ANI 206 History of Animation

ANI 230 3d Modeling

ANI 231 3d Animation

and a choice of two courses from the following list:

DC 215 Digital Sound Design

DC 275 Cinematography and Lighting

DC 201 Introduction to Screenwriting

DC 210 Digital Cinema Production I

DC 220 Editing I

GAM 244 Game Development I

GAM 245 Game Development II

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 Foundation Phase of the program. Students may submit the Change of Status request by logging in to MyCDM .

### **Foundation Phase**

ANI 460 Animation Graduate Seminar  
DC 461 Production Workshop  
DC 462 Production Seminar

### **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.

ANI 436 Advanced 3d Character Modeling  
ANI 430 3d Character Animation  
ANI 439 3d Texturing and Lighting

### **Major Electives**

Students in this program must choose any 4 ANI, GPH, DC or GAM graduate level courses.

### **Open Electives**

Students must also take 3 graduate-level CDM courses.

### **Program, Grade and GPA Requirements**

The MS in Digital Cinema Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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 this 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

## Master of Science in Human-Computer Interaction

College of Computing and Digital Media - Graduate Studies ▫ School of Cinema and Interactive Media (CIM) ▫ Master of Science in Human-Computer Interaction

### **Requirements**

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

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

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

## Program Information

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

- Prerequisite Phase
- Foundation Phase
- Advanced Phase
- Electives Phase
- Capstone Phase

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 Foundation courses offer knowledge in the multiple disciplines that contribute to HCI. Students in the Foundation Phase acquire an understanding of the technological and theoretical foundations, and the Advanced and Electives Phases provide students the opportunity to study specialized topics in greater depth. These phases add depth to the work completed in the previous phases. The degree culminates in the experience of the Capstone Course where students undertake a comprehensive project involving analysis, design, implementation and evaluation.

## Course Requirements

### Prerequisite Phase

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

IT 130	The Internet and the Web <a href="#">Self Placement Test</a>
IT 223	Data Analysis <a href="#">Self Placement Test</a>
IM 230	Scripting for Interactive Media
or IM 336	Interactive Media Scripting for Programmers
IM 270	User-Centered Web Design
HCI 402	Foundations of Digital Design *

\* HCI 402 is not currently offered online. Consult your advisor for determining suitable alternative coursework.

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 MyCDM.

### Foundation Phase

Students should complete their Prerequisite courses before beginning the Foundation courses. However, while completing the Prerequisite courses, students may take Foundation courses with consent of their advisor.

The Foundation courses for the MS in Human-Computer Interaction are:

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

## Advanced Phase

Students must complete all Prerequisite courses and should be finishing Foundation courses before taking Advanced courses.

The Advanced courses are:

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

## Electives Phase

Students must complete five elective courses. Four of these courses should come from the approved lists below. The fifth course can be an advisor-approved elective from the College of CDM. All Electives Phase courses in CDM must be numbered 420 or higher.

The HCI offerings include:

HCI 422	Multimedia
HCI 432	User-Centered Web Development
HCI 511	Designing for Disabilities
HCI 521	Designing for Content Management Systems
HCI 530	Usability Issues for Handheld Devices
HCI 590	Topics in Human-Computer Interaction

Non-HCI Electives open to all HCI graduate students

CSC 423	Data Analysis and Regression
CSC 424	Advanced Data Analysis
CSC 428	Data Analysis for Experimenters
CSC 449	Database Technologies
CSC 451	Database Design
CSC 587	Cognitive Science
ECT 433	Survey of Web Programming Technologies
ECT 455	E-Commerce Web Site Engineering
ECT 480	Intranets and Portals
ECT 586	Customer Relationship Management Technologies
IS 456	Knowledge Management Systems
IS 511	Social Issues of Computing
IS 570	Enterprise System Implementation
ITS 427	Learning and Technology
ITS 431	Instructional Delivery and Course Management Systems
ITS 560	Training and User Support
IT 432	Web Architecture for Non-Programmers
PM 430	Fundamentals of IT Project Management
PM 440	Collaborative Technologies for Leading Projects
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 Organization Psychology

SE 477      Software and Systems Project Management  
SE 482      Requirements Engineering

Non-HCI Electives open to HCI students with programming experience.

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

### **Capstone Phase**

Students must complete the following course:

HCI 594              Human-Computer Interaction Capstone \*

\* HCI 594 is not currently offered online. Consult your advisor for determining suitable alternative course work.

### **Program, Grade and GPA Requirements**

The MS in Human-Computer Interaction Program consists of a minimum of 52 hours (typically 13 courses) not including required prerequisite courses.

**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.

# The Vincentian Character of DePaul University

College of Computing and Digital Media - 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.

# Courses

College of Computing and Digital Media - Graduate Studies ▢ Courses

## **Courses**

Please visit Campus Connection at <https://campusconnect.depaul.edu> for current course information. If you do not have a password for Campus Connection you may log on as a guest. Once you are on Campus Connection please select Course Catalog followed by the department.