Course Catalog

School of Computer Science Telecommunications

Winter/Spring 2007-2008
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General Information

DePaul CTI features 14 degree programs designed to keep pace with the latest developments in technology while remaining grounded in the liberal arts and sciences. DePaul students can also explore their academic curiosity through 18 minor concentrations that reflect the diverse offerings of CTI's majors.

Facilities

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

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

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

First Year Student Applicants

Deadlines And Requirements
1. We recommend you apply by February 1st for Priority/Regular admission or by November 15 for Early Action Program admission. Applications are considered on a space available basis until August 15 by rolling notification. (Applications to The Theatre School must be submitted by January 15th. Notification of Music and Theatre admission decisions will be made in late March.)

2. Either the SAT or ACT is required. If your ACT or SAT scores do not appear directly on your high school transcript, request the testing agency to forward a score report to De Paul, if you have not already done so. Our college code number for ACT is 1012 and for SAT is 1165.

3. If you have earned college credit while in high school, request the college or Advanced Placement service which granted you credit to forward your official record to De Paul.

4. Send all materials to:
   Office of Admission
   1 E. Jackson Blvd.
   Chicago, IL 60604

NOTE: If you have ever enrolled in another college or university (regardless if you earned any credit) after high school graduation, please fill out the Transfer Student application.

Transfer Student Applicants

Transfer students (under age 24) who currently attend another college/university and plan to complete a baccalaureate degree at De Paul should complete and submit this application, the $40 application fee ($25 if you apply online) and official transcripts from every college/university attended. Students who have earned fewer than 30 semester (44 quarter) hours of transferable college work at the time of application submission must additionally provide an official high school transcript and an ACT/SAT score report. If you are currently in college, please indicate (on a separate sheet of paper) what courses you will be enrolled in for the current term or for a future term. (Example: Eng 101/English Composition I - 3 semester hours.)

Note: Students educated outside the United States or with international credit, and students with F1 or J1 visa status should apply for admission a minimum of two months before the beginning of the desired quarter using the application for international student admission.
of study that best reflects their academic and career interests, skills, and lifestyle.

Professional Development

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

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

Current certificate program offerings include:

**IPD 360/460 SQL Server Business Intelligence Program**
An 11-week in-depth program covering SQL Server 2005 analysis services, integration services, and reporting services

**IPD 361/461 SQL Server Database High Availability Program**
An 11-week comprehensive overview of the various high availability solutions available with the latest edition of Microsoft's SQL Server

**IPD 362 Open-Source Web Development Program**
A 5-week program addressing rapid and efficient development of business-critical Web applications using Linux, Apache, PostgreSQL and Python

**IPD 363 SQL Server Database Administration Program**
An 11-week in-depth program covering database administration using SQL Server

**IPD 364 Lightweight Java Web Development Program**
A 8-week comprehensive program covering open-source, lightweight Java enterprise Web development using POJOs (Plain Old Java Objects)

**IPD 365 Ruby on Rails Program**
A 7-week in-depth program covering Web development using Ruby on Rails

**IPD 370 Advanced SQL Program**
A 2-week program covering advanced SQL features

**IPD 380 IT Project Management Program**
A 10-week comprehensive program covering best practices in information systems project management

**IPD 390 Information Systems Security Management Program**
A 10-week comprehensive program covering best practices in designing, implementing and maintaining an organizational information security plan

**IPD 394 Java EE Developer Program**
A 10-week in-depth program covering enterprise-wide applications development using Java EE

**IPD 382 Java Developer Program**
A 10-week comprehensive program covering object-oriented applications development using Java

**IPD 366 Java Web Services Program**
A 7-week concentrated program covering service-oriented architecture and the development of Web services using Java

**IPD 389 .NET Developer Program**
A 10-week comprehensive program covering .NET technologies

**IPD 368/468 .NET Mobile Applications Development Program**
A 10-week focused program covering the basic skills and techniques for successfully building mobile applications using the .NET platform
**IPD 398 .NET Web Services Program**
An 8-week concentrated program covering service-oriented architecture and the development of Web services using the .NET platform

**IPD 392 Telecommunications Program**
An 11-week intensive program focusing on the configuration, implementation and ongoing support of telecommunications systems and networks

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**Transfer Credit**

Prospective students may transfer credit from an accredited college to DePaul University. All transfer credit will be initially evaluated by an Admission counselor; final course placement will be made by an academic advisor in the School of Computer Science, Telecommunications and Information Systems (CTI). For specific information governing transfer admission and evaluation of credit, please consult DePaul CTI Admissions. Current CTI students may take courses at another accredited college either in the summer or during the regular school year and transfer the credit back to DePaul University only with prior approval from the students academic advisor.

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**Grades**

Students must earn grades of C or above in all courses taken for credit in the major field. Grades of C- may be accepted for major field credit provided the overall grade point average within the major is 2.0 or above. All other courses require grades of D or better. In addition, all students must complete a minimum of 192 quarter hours of college credit.
Administration

DAVID MILLER, Ph.D.
Dean

GREGORY BREWSTER, Ph.D.
Associate Dean

LUCIA DETTORI, Ph.D.
Associate Dean

MARTIN KALIN, Ph.D.
Associate Dean

LINDA V. KNIGHT, Ph.D.
Associate Dean
Faculty

DAVID MILLER, Ph.D.
Dean
University of Chicago

OLAYELE ADELAJUN, 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

DAVID ANGULO, M.S.
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Loyola University Chicago

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

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

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

JACEK BRZEZINSKI, Ph.D.
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DePaul University

ROBIN BURKE, Ph.D.
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Northwestern University

ALAN BURNS, Ph.D.
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Kent State University

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ANTHONY CHUNG, Ph.D.
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University of Maryland Baltimore County

LUCIA DETTORI, Ph.D.
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SCOTT ERLINDER, MFA
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Columbia College
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
HENRY HARR, Ph.D.
Professor Emeritus
Illinois Institute of Technology
DANA HODGDON, M.A.
Visiting Professor
Northwestern University
JANE HUANG, Ph.D.
Assistant Professor
University of Illinois at Chicago
LOUIS IBARRA, Ph.D.
Assistant Professor
University of Victoria
MATT IRVINE, MFA
Assistant Professor
Columbia College
RADHA JAGADEESAN, Ph.D.
Professor
Cornell University
XIAOPING JIA, Ph.D.
Professor
Northwestern University
JOSHUA JONES, MFA
Assistant Professor
University of Southern California
STEVE JOST, Ph.D.
Associate Professor
Northwestern University
MARTIN KALIN, Ph.D.
Professor and Associate Dean
Northwestern University
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Associate Professor
Texas A & M University
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    Professor
    Yale University
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    Associate Professor
    Carnegie Mellon University
JOHN MCDONALD, Ph.D.
    Associate Professor
    Northwestern University
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    Associate Professor
    University of Michigan
DANIEL MITTLEMAN, Ph.D.
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    The University of Arizona
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    Associate Professor
    Iowa State University
JAMI MONTGOMERY, Ph.D.
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    Illinois Institute of Technology
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    Associate Professor
    Tulane University
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    University of Illinois at Chicago
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    University of California, Los Angeles
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    American Film Institute
LIJUBOMIR PERKOVIC, Ph.D.
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    Carnegie Mellon University
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    University of Michigan
CORIN PITCHER, Ph.D.
    Assistant Professor
    University of Oxford
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    Oakland University
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    Associate Professor
    University of Chicago
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    University of Chicago
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ERIC SEDGWICK, Ph.D.
    Associate Professor
    University of Texas
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    University of Perugia
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University of Chicago
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   Brown University
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   University of California at Los Angeles
NORIKO TOMURO, Ph.D.
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   DePaul University
CURT WHITE, Ph.D.
   Associate Professor
   Wayne State University
PETER WIEMER- HASTINGS, Ph.D.
   Associate Professor
   University of Michigan, Ann Arbor
CHARLES WILCOX, B.A.
   Instructor
   Southern Illinois University
ROSALEE WOLFE, Ph.D.
   Professor
   Indiana University
JAMES YU, Ph.D.
   Assistant Professor
   Purdue University
LU ZHANG, Ph.D.
   Visiting Assistant Professor
   Iowa State University
JOANNE ZIELINSKI, M.F.A.
   Associate Professor
   Rutgers University
Academic Programs

School of Computer Science, Telecommunications & Information Systems - Undergraduate Studies △ Academic Programs

Liberal Studies Program and Modern Language Option

LIBERAL STUDIES PROGRAM

There are two components to the Liberal Studies Program. The first, called the Common Core, emphasizes communication, quantitative skills and intellectual abilities, as well as an introduction to the urban and Vincentian nature of the University. Integration of the general education program is further enhanced by a series of common experiences throughout the student's educational career. These experiences are the First Year Program (including: Chicago Quarter, Focal Point Seminar, and Writing); Sophomore Seminar on Multiculturalism in the United States; Junior Year Experiential Learning; and Senior Year Capstone.

The second part of the program, called Learning Domains, is concerned mainly with the subjects that make up the conventional liberal arts and sciences curriculum. Breadth of learning is assured by asking students to do course work in six learning domains: Arts and Literature (AL); Philosophical Inquiry (PI); Religious Dimensions (RD); Scientific Inquiry (SI); Self, Society, and the Modern World (SSMW); and Understanding the Past (UP).

The domains of the Liberal Studies Program represent possible ways of grouping the various kinds of courses taught in the University. They identify and focus attention on areas of inquiry that are significantly similar are to be found, though not all activities carried on within a domain are identical. A person who has received a liberal education has experienced in both practical and theoretical ways the many types of intellectual inquiry represented in the university community. These particular domains facilitate that experience. They represent society’s intellectual life in its theoretical, practical, and artistic moments.

Through the programs of study within the domains, students are invited to create or discover for themselves, however provisionally, a map of the intellectual world.

Finally, pre-collegiate skills in communication and computation are a prerequisite for domain study. Some students are required to take certain skills courses before they can begin the Liberal Studies Program. Moreover, since these writing and computation skills are an integral part of all college work, all liberal studies courses seek to develop these skills further.

MODERN LANGUAGE OPTION

Students who wish to study a Modern Language may do so for liberal studies credit. Those who begin the language at the introductory or intermediate level must complete a three-course sequence for liberal studies credit.

Students who complete a three-course sequence may substitute two of the three courses for liberal studies credit. Students can select one course each from two of the following learning domain combinations: Arts and Literature or Scientific Inquiry (cannot substitute for the lab science requirement); Philosophical Inquiry or Religious Dimensions; Self, Society, and the Modern World or Understanding the Past. The third course of the sequence fulfills open elective credit. Students interested in this option should consult the listing for their college or school in this course catalog to determine the Liberal Studies courses for which the Modern Language Option will substitute.

Note: The Modern Language Option may not be used to meet the language requirement for Bachelor of Arts students in the College of Liberal Arts and Sciences or School of Education. It may be used for advanced study once the requirement is met. The introductory language sequence will not fulfill the Modern Language Option and will not be counted for Liberal Studies credit for students who are native speakers of the language. The intermediate sequence will not fulfill the Modern Language Option and will not be counted for Liberal Studies credit for students who are native speakers of the language unless the chair of the Modern Languages Department so recommends.

Interested students should contact their academic advisor or their college office for information concerning the regulations and procedures governing the exercise of this option.
Bachelor of Arts Digital Cinema
Bachelor of Science in Digital Cinema
Bachelor of Science in Network Technologies
Bachelor of Science in Mathematics / Computer Science
Bachelor of Arts in Computing
Bachelor of Science in Information Technology

CTI Liberal Studies Courses

School of Computer Science, Telecommunications & Information Systems - Undergraduate Studies ▪ Academic Programs ▪ CTI

CTI Liberal Studies Courses

Have you ever been interested in learning how to create interactive web environments, put together computer animation, or do you want to know more about codes and ciphers as featured in the movies Enigma or Windtalkers? Then CTI has some great courses for you!

CTI offers dozens of courses in many domains of the Liberal Studies Program. You can experiment with computer graphics, programming and e-commerce technology and fulfill a requirement at the same time. Many of these courses also serve as gateway courses into more advanced CTI courses. Who knows, you might just like it and want to come back for more!

If you have a specific interest, in something like how the Internet functions, you can click here for a list of courses by topic.

CTI Liberal Studies Courses for CTI students

-Rule 1-
A CTI student can take any CTI course approved for liberal studies credit and use it to satisfy a domain of the liberal studies program (LSP) provided:

1. The course is NOT required as part of the students major
   EXAMPLES:
   • a CGMT student cannot use GPH 211 to satisfy the arts and literature requirement of LSP, as GPH 211 is required by all CGMT tracks.
   • An ECT major CAN take GPH 211 to satisfy the arts and literature requirement of the LSP

2. The course qualifies for a liberal studies program domain that is required by the students major
   EXAMPLES:
   • a CS student CAN take GPH 259 to satisfy the Scientific Inquiry (SI)-Quantitative-Lab requirement of LSP because the course is not required by the CS major AND it counts for SI-Lab which is a required domain for CS students
   • any CTI student CANNOT take CSC 250 to satisfy SI because, although the course is not required by any of our programs, it qualifies for SI-quantitative (not Lab) which is NOT a required domain for CTI students

-Rule 2-
No double counting allowed for CTI classes by CTI students.
EXAMPLES:
• A CS student takes GPH 211 for arts and literature LSP. Although GPH 211 is allowed as an elective even if it is not a 300 level course, the student CANNOT count the course both as satisfying an LSP domain AND as an elective for the CS program
CTI Liberal Studies Courses by Liberal Studies Area

Arts and Literature

**DC 125 Digital Still Photography for Non-Majors**
This course is an introduction to the history and aesthetics of still photography and to the concept of photography as a descriptive and interpretive artistic medium. Students studying photographs in this context will discover relationships between individual photographers choices and their own understanding of meaning. Students will learn the fundamental concepts necessary to shoot, edit, manipulate, and print digital still photographs.

**DC 201 Introduction to Screenwriting**
This course focuses on narrative storytelling and encourages students to find their unique voices, while emphasizing the critical importance of working as part of a creative team.

**DC 205 Foundations of Cinema**

**DC 250 Working with Actors 1**
This course is an introduction and examination of the collaborative process between the actor and director. Methods of study include lecture, discussion, assignments, and in-class acting exercises.

**GAM 224 Introduction to Game Design**
Students will learn about a game's "hook", its "high concept" and the crucial needs of marketing for a successful game design. Students will also learn to design a game's component pieces.

**GPH 211 Perceptual Principles for Digital Environments I**
**GPH 212 Perceptual Principles for Digital Environments II**
**GPH 213 Perceptual Principles for Digital Environments III**
These three foundational courses in computer animation take you through the process of creating 2-D and 3-D representations on the computer. The last course teaches you how to animate them!

**ANI 101 Animation for Non-Majors**
Course introduces a variety of basic animation techniques for cinema and gaming, such as hand-drawn, cutout, stop-motion and (very basic) 3D, with an emphasis on the use of computer technology.

**ANI 206 History of Animation**
History of Animation: This course is an introduction to the history and development of the field of animation.

Junior Experiential Learning Credit

**CSC 298 Internship**
Computer Science Internship In cooperation with local employers this course offers students the opportunity to integrate their academic experience with on-the-job training in computer related work areas.

**CSC 378 Software Projects for Community Clients**

**CSC 379 Technology Partnerships in Urban Schools**
Students in this course will have the opportunity to assess urban community needs in the technology arena and develop skills in assisting and developing methods for bridging the digital divide that exists.

**DC 380 Project Bluelight**
Production of a feature-length digital motion picture written by students or faculty within the Digital Cinema program.

**IT 300 Research Experience**
This course involves the exploration of a research topic under the supervision of a research advisor.

**GPH 360 Modeling Spaces**
The digital design and modeling of environmental spaces with attention to human use parameters.

Scientific Inquiry: Elective

**CSC 235 Problem Solving**
How do you solve a problem? In this course we discuss different problem solving techniques and strategies such as modeling, establishing subgoals, and searching and pruning.

**CSC 200 Survey of Computing**
Learn about careers using computers and pick up some skills to help you manage your own PC or network!

**CSC 210 Introduction to Computing**
A brief history of computers and an introduction to programming.

**CSC 211 Programming in Java I**
**CSC 212 Programming in Java II**
Two courses in programming JAVA, a cross-platform, web-enabled language.

**CSC 261 Programming Languages I: C/C++**
**CSC 262 Programming Languages II: C/C++**
Two courses in programming C++

**CSC 233 Codes and Ciphers**
A history of code making and breaking and the math and (computer) science behind it

**ECT 250 Internet, Commerce, and Society**
Ever shop online? Learn the basics behind how these kinds of web sites function

**IT 130 The Internet and the Web**
Learn to design your own web site!

**IT 236 User Interface Development**

**IT 240 Introduction to Desktop Databases**
Learn introductory concepts in constructing databases and networking files.

**IT 263 Applied Networks and Security**

**TDC 361 Basic Communication Systems**
Learn about how networks work and how they impact your daily life.

**Scientific Inquiry: Lab/Quantitative**

**GPH 259 Design Geometry (cross-listed as ART 295)**
Learn the basics of Computer Aided Design.

**Scientific Inquiry: Quantitative**

**CSC 239 Personal Computing**
You will learn how to use Excel to analyze data and how to publish data and retrieve it from the World Wide Web.

**IT 223 Data Analysis**

**CSC 250 Computers and Human Intelligence**
Study how computers are designed to think like people.

**HCl 201 Multimedia and the World Wide Web**
Overview of the Web, its origins and capabilities. Create your own sample web page.

**Self, Society, and the Modern World**

**DC 105 Digital Media Literacies**
This course is designed to help students develop an informed, critical and practical understanding of new communication media, including ways to read, write and produce in a digital environment.

**IT 201 Introduction to Information Systems**
This course examines how various types of computer-based information systems form a critical part of modern organizations, how they work, and how they impact workers, organizations and the economy.

**IS 208 IT, Economy and Society**
This course broadly surveys the history of IT applications and information systems from the historical perspective, and critically assesses the digital impact on industry, the economy, workers, citizens, social class and the future.

**CSC 223 The Impact of Computing Technology On Our Lives**
This course will introduce students to an overview of social analysis techniques and the theories of social change.

**Understanding the Past: Intercontinental/Comparative**

**GAM 206 History of Games**
This class will examine particular games and game genres in their historical context using a case study format.

**GPH 205 Historical Foundations of Visual Technology**
This course is a survey of the development, application and meaning of visual technologies in a wide range of world cultures from pre-history to the present.

**Philosophical Inquiry**

**CSC 208 The Computer and Social Responsibility**
This course will research the impact technology has had in various areas of our lives, the new responsibilities technology presents, and our ability to deal with these changes in an ethical manner.

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**CTI Liberal Studies Courses by Course Topic**

**The Internet and How It Works**

**HCI 201 Multimedia and the World Wide Web**: Scientific Inquiry: Quantitative
Overview of the Web, its origins and capabilities. Create your own sample web page.

**ECT 250 Internet, Commerce, and Society**: Scientific Inquiry: Elective
Ever shop at Gap.com? Learn the basic behind how these kinds of web sites function.

**IT 130 The Internet and the Web**
Learn to Design Your Own Website

**IT 263 Applied Networks and Security**
Programming and Basic Computer Know-How

**CSC 200 Survey of Computing**: Scientific Inquiry: Elective
Learn about Careers using computers and pick up some skills to help you manage your own PC or network!

**CSC 210 Introduction to Computing**: Scientific Inquiry: Elective
A brief history of computers and an introduction to programming

**CSC 211 Programming in Java I**: Scientific Inquiry: Elective
**CSC 212 Programming in Java II**: Scientific Inquiry: Elective
Two courses in programming JAVA, a cross-platform, web-enabled language.

**CSC 261 Programming Languages I: C/C++**
**CSC 262 Programming Languages II: C/C++**
Two courses in programming C++.

**TDC 361 Basic Communication Systems**

**The Computer and Society**

**IT 201 Introduction to Information Systems**
This course examines how various types of computer-based information systems form a critical part of modern organizations, how they work, and how they impact workers, organizations and the economy.

**IS 208 IT, Economy and Society**
This course broadly surveys the history of IT applications and information systems from the historical
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This course will introduce students to an overview of social analysis techniques and the theories of social change.

**CSC 208 The Computer and Social Responsibility**
This course will research the impact technology has had in various areas of our lives, the new responsibilities technology presents, and our ability to deal with these changes in an ethical manner.

**Computer Graphics and Motion Technology**

**GPH 205 Historical Foundations of Visual Technology**
This course is a survey of the development, application and meaning of visual technologies in a wide range of world cultures from pre-history to the present.

**GPH 211 Perceptual Principles for Digital Environments I: Arts and Literature**
**GPH 212 Perceptual Principles for Digital Environments II: Arts and Literature**
**GPH 213 Perceptual Principles for Digital Environments III: Arts and Literature**
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Learn the basics of Computer Aided Design.

**GPH 360 Modeling Spaces**
The digital design and modeling of environmental spaces with attention to human use parameters.

**ANI 101 Animation for Non-Majors**
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**ANI 206 History of Animation**
History of Animation: This course is an introduction to the history and development of the field of animation.

**Data Analysis and Retrieval**

**CSC 235 Problem Solving**
How do you solve a problem? In this course we discuss different problem solving techniques and strategies such as modeling, establishing subgoals, and searching and pruning.

**CSC 239 Personal Computing: Scientific Inquiry: Quantitative**
You will learn how to use Excel to analyze data and how to publish data and retrieve it from the World Wide Web.

**IT 223 Data Analysis**

**IT 240 Introduction to Desktop Databases: Personal Computing for Programmers: Scientific Inquiry: Elective**
Learn introductory concepts in constructing databases and networking files.

**Design your own web site**

**HCI 201 Multimedia and the World Wide Web: Scientific Inquiry: Quantitative**
Overview of the Web, its origins and capabilities. Create your own sample web page.

**ECT 250 Internet, Commerce, and Society: Scientific Inquiry: Elective**
Ever shop at Gap.com? Learn the basic behind how these kinds of web sites function.

**IT 130 The Internet and the Web (formerly ECT 270): Scientific Inquiry: Elective**
Learn to design your own complex web site!

**Codes, Ciphers and Computer Intelligence**
**CSC 250** *Computers and Human Intelligence*: Scientific Inquiry: Quantitative
Study how computers are designed to think like people

**CSC 233** *Codes and Ciphers*: Scientific Inquiry: Elective
A history of code making and breaking and the math and (computer) science behind it

**Digital Cinema and Gaming**

**DC 105** *Digital Media Literacies*
This course is designed to help students develop an informed, critical and practical understanding of new communication media, including ways to read, write and produce in a digital environment

**DC 125** *Digital Still Photography for Non-Majors*
This course is an introduction to the history and aesthetics of still photography and to the concept of photography as a descriptive and interpretive artistic medium. Students studying photographs in this context will discover relationships between individual photographers choices and their own understanding of meaning. Students will learn the fundamental concepts necessary to shoot, edit, manipulate, and print digital still photographs

**GAM 206** *History of Games*
This class will examine particular games and game genres in their historical context using a case study format

**DC 201** *Introduction to Screenwriting*
This course focuses on narrative storytelling and encourages students to find their unique voices, while emphasizing the critical importance of working as part of a creative team.

**DC 205** *Foundations of Cinema*

**DC 250** *Working with Actors 1*
This course is an introduction and examination of the collaborative process between the actor and director. Methods of study include lecture, discussion, assignments, and in-class acting exercises.

**GAM 224** *Introduction to Game Design*
Students will learn about a game's "hook", its "high concept" and the crucial needs of marketing for a successful game design. Students will also learn to design a game's component pieces.

**ANI 101** *Animation for Non-Majors*
Course introduces a variety of basic animation techniques for cinema and gaming, such as hand-drawn, cutout, stop-motion and (very basic) 3D, with an emphasis on the use of computer technology.

**ANI 206** *History of Animation*
History of Animation: This course is an introduction to the history and development of the field of animation.

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**Bachelor of Science in Computer Games Development**

The **Bachelor of Science in Computer Games Development** is ideal for creative-minded and technically adept individuals with a passion for crafting interactive experiences. It offers career opportunities for skilled, creative programmers, designers, and animators.

The **BS in Computer Games Development** prepares students to work in the multi-disciplinary field of computer gaming and interactive media. This program also requires strong mathematical and programming skills.
CTI's Computer Game Development program combines coursework in game programming, game design, 3D Modeling, animation, physics, and artificial intelligence. Students work in cross-disciplinary teams to design and develop games.

The BS in Computer Games Development offers a Standard concentration and a concentration in Game Programming.

What students will learn from this degree program:

- game programming
- game physics and game engines
- computer graphics and rendering
- 3D modeling and animation
- game design and level design

The Liberal Studies program is the general education portion of the curriculum at DePaul. Click here to view the CTI courses that qualify for liberal studies credit.

Four-year schedule of courses for the **Standard Concentration**

**First Year**

*Major Field Courses (5)*

GAM 224 Introduction to Game Design  
GAM 244 Game Development I  
GAM 245 Game Development II  
ANI 101 Animation for Non-Majors  
or ANI 201 Animation I  
ANI 105 Intro to Visual Design

*Liberal Studies (7) (DC 201 required as one of the LS courses)*

**Second Year**

*Major Field Courses (7)*

MAT 150 Calculus I  
GAM 341 Artifact, Level and Terrain Design  
ANI 230 3d Modeling for Animation and Gaming  
CSC 261 Programming Languages I: C/C++  
CSC 262 Programming Languages II: C/C++  
IM 220 Interactive Media I

*Gaming Elective (1)*  
*Liberal Studies (5)*

**Third Year**

*Major Field Courses (7)*

ANI 231 3d Animation for Cinema and Gaming  
GAM 350 Physics for Game Developers  
GAM 374 Action Games Programming

*Gaming Electives (4)*  
*Liberal Studies (4) - (IT 228 Required as one of the LS courses)*

**Fourth Year**

*Major Field Courses (6)*

ANI 300 3d Character Animation
Four-year schedule of courses for the Game Programming Concentration:

**First Year**

**Major Field Courses (5)**

ANI 105 Intro to Visual Design  
GAM 224 Introduction to Game Design  
GAM 244 Game Development I  
MAT 150 Calculus I  
MAT 151 Calculus II

**Liberal Studies (7)** (DC 201 and ANI 101 Required as two of the LS courses)

**Second Year**

**Major Field Courses (5)**

CSC 261 Programming Languages I: C/C++  
CSC 262 Programming Languages II: C/C++  
CSC 393 Data Structures in C++  
GAM 245 Game Development II  
ANI 230 3d Modeling for Animation and Gaming

**Gaming Electives (2)**  
**Liberal Studies (5)**

**Third Year**

**Major Field Courses (6)**

CSC 373 Computer Systems I  
CSC 374 Computer Systems II  
GPH 321 Computer Graphics Development I  
GPH 329 Computer Graphics Development II  
GAM 350 Physics for Game Developers  
GAM 374 Action Games Programming

**Gaming Electives (2)**  
**Liberal Studies (4)** (IT 228 required as one of the LS courses)

**Fourth Year**

**Major Field Courses (5)**

GPH 389 Real-Time Graphics Techniques  
GAM 376 Artificial Intelligence for Computer Games  
GAM 392 Game Modification Workshop  
GAM 394 Game Development Project I  
GAM 395 Game Development Project II

**Gaming Electives (1)**  
**Liberal Studies (3)**
Open Electives (3)

Gaming Electives
Any 200-level ANI, DC, GAM, GPH or IM Course
Any 300-level CTI Course

Open Electives
Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option (see the undergraduate Bulletin for details). If you wish to pursue a minor, most minor field courses will be credited as open electives.

Note: Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be 'C' or better. Grades of 'C-' may be accepted provided the overall grade point average in the major is 2.0 or better.

Bachelor of Science in Computer Graphics and Motion Technology

The Bachelor of Science in Computer Graphics and Motion Technology unites the technical and aesthetic principals of digitally created motion graphics and animation. Graduate of the program may find opportunities in diverse fields, from motion pictures or architecture to computer gaming or medicine.

The BS in Computer Graphics and Motion Technology provides DePaul students with an interest in mathematics/computer science as well as visual design, an academic foundation in both the technical and aesthetic elements of computer graphics.

The Bachelor of Science degree program offers two options of study:

- The Developer concentration is geared toward students who are considering careers in graphic software development, with course work focused in programming languages (C/C++) and mathematics (calculus and algebra), in addition to animation and computer graphics.
- The Technical Designer concentration is geared toward students interested in the visual aspects, including lighting setup, shader development and character rigging.

What students learn in this degree program:

- Design and analysis of mathematics/computer science principals for computer graphic design.
- Beginning and advance digital photography.
- History and theory of graphic design (color theory, perception).
- Usability and human-computer interaction.

The Liberal Studies program is the general education portion of the curriculum at DePaul. Click here to view the CTI courses that qualify for liberal studies credit.

Four-year schedule of courses for the Developer Concentration:

First Year

Major Field Courses (9)

CSC 261 Programming Languages I: C/C++
CSC 262 Programming Languages II: C/C++
CSC 393 Data Structures in C++
CSC 211    Programming in Java I  Self Placement Test Available!
and CSC 212    Programming in Java II
OR CSC 261    Programming Languages I: C/C++
and CSC 262    Programming Languages II: C/C++
GPH 211    Perceptual Principles for Digital Environments I
GPH 212    Perceptual Principles for Digital Environments II
ANI 201    Animation I
MAT 140    Discrete Mathematics I
MAT 150    Calculus I
MAT 151    Calculus II

Liberal Studies (3)

Second Year

Major Field Courses (5)

GPH 325    Survey of Computer Graphics
GPH 329    Computer Graphics Development II
GPH 339    Advanced Rendering Techniques
GPH 321    Computer Graphics Development I
or MAT 220    Linear Algebra with Applications
CMN 220    Public Speaking

Liberal Studies (7)

Third Year

Major Field Courses (4)

GPH 372    Principles of Computer Animation
CSC 321    Design and Analysis of Algorithms
IM 315    Theory and Perception of Color
WRD 204    Technical Writing [formerly Eng 204]

Graphics Electives (3) - from the list at the bottom of the page.
Liberal Studies (5)

Fourth Year

Major Field Courses (4)

GPH 375    Advanced Graphics Development
GPH 388    Production Pipeline Techniques
GPH 389    Real-Time Graphics Techniques
GPH 395    Computer Graphics Senior Project

Graphics Electives (1) - from the list at the bottom of the page.
Liberal Studies (4)
Open Electives (3)

Four-year schedule of courses for the Technical Designer Concentration:

First Year

Major Field Courses (6)

CSC 211    Programming in Java I  Self Placement Test Available!
and CSC 212    Programming in Java II
OR CSC 261    Programming Languages I: C/C++
and CSC 262    Programming Languages II: C/C++
GPH 211    Perceptual Principles for Digital Environments I
GPH 212    Perceptual Principles for Digital Environments II
ANI 201    Animation I
MAT 140    Discrete Mathematics I

Liberal Studies (4) - ART 102 and ART 106 are required.
Second Year

Major Field Courses (7)

GPH 250 Digital Modeling I
GPH 325 Survey of Computer Graphics
IT 236 User Interface Development
ART 242 Survey of Asian Art
IM 210 Introduction to Human-Computer Interaction
CMN 220 Public Speaking
GPH 255 Hand Prototyping for Graphic Visualization

Liberal Studies (5)

Third Year

Major Field Courses (5)

ART 322 Modernism to Postmoderism
IM 315 Theory and Perception of Color
GPH 338 Survey of 3-D Animation
GPH 339 Advanced Rendering Techniques
WRD 204 Technical Writing [formerly Eng 204]

Graphics Electives (1) - from the list at the bottom of the page.

Liberal Studies (6)

Fourth Year

Major Field Courses (2)

GPH 395 Computer Graphics Senior Project
GPH 388 Production Pipeline Techniques

Graphics Electives (4) - from the list at the bottom of the page.

Liberal Studies (4)

Open Electives (4)

Graphics Electives List

Students may take any of the following courses as long as they were not previously used to satisfy the computer graphics and animation core:

ANI 300 3d Character Animation
ANI 310 Motion Capture Workshop
ART 225 Beginning Photography
ART 329 Advanced Digital Photography
[prereq: Art 225 and Art 101 Or Art 227 Or Instructor Consent]
ART 360 Illustration
ART 373 History of Design
IT 223 Data Analysis Self Placement Test Available!
IT 236 User Interface Development
GPH 336 Smooth Surface Modeling for Graphics and Animation
GPH 340 Procedural Shading
GPH 341 Advanced Lighting Techniques
GPH 348 Rigging for Animation
GPH 376 Artificial Intelligence in Computer Games
GPH 380 Visualization
GPH 389 Real-Time Graphics Techniques
GPH 250 Digital Modeling I
GPH 259 Design Geometry
GPH 329 Computer Graphics Development II
GPH 350 Digital Modeling II
GPH 360 Modeling Spaces
GPH 360    Modeling Spaces
GPH 374    Advanced Graphics Development
IM 270    User-Centered Web Design
IM 210    Introduction to Human-Computer Interaction
IM 322    Multimedia
MAT 150    Calculus I
MAT 151    Calculus II
MAT 152    Calculus III [prereq MAT 151 or MAT 161 or MAT 171]

Open Electives
Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option (see the undergraduate Bulletin for details). If you wish to pursue a minor, most minor field courses will be credited as open electives.

Note: Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be 'C' or better. Grades of 'C-' may be accepted provided the overall grade point average in the major is 2.0 or better.

School of Computer Science, Telecommunications & Information Systems - Undergraduate Studies  ▪ Academic Programs  ▪ Bachelor of Science in Computer Science

Bachelor of Science in Computer Science

Graduates of the Bachelor of Science in Computer Science program are skilled problem solvers, sought-after programmers and software developers, and computer systems experts. They use their skills to improve or develop computer applications in a wide variety of areas.

Computer Science is a field that spans diverse areas including:

- Security and Cryptography
- Robotics
- Data Mining and Databases
- Distributed and Mobile Systems
- Intelligent Systems and gaming
- Computation Biology, and more

The BS in Computer Science at DePaul CTI provides essential training in the foundations of computing, data storage and information processing. With this foundation, graduates of the program can easily adapt to and create new information technologies, new computing paradigms, and new ideas for applying computer systems.

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

What students learn in the BS in Computer Science program:

- Programming and software development skills, the technical tools of the IT trade
- An understanding of modern Computer Systems, which you will use to develop computer applications
- Skills in application areas such as security and cryptography, robotics and computer vision, data mining and databases, distributed and mobile systems, intelligent systems and gaming, computational biology, etc.

The Liberal Studies program is the general education portion of the curriculum at DePaul. Click here to view the CTI courses that qualify for liberal studies credit.

The coursework for the B.S. in Computer Science consists of:
- The DePaul University Liberal Studies Program: (19 courses, not including the Senior Capstone),
- Major Field courses (24 courses or 96 credits, including the Senior Capstone), and
- Open Elective courses (5 courses or 20 credits).

**Note**: CSC 208 The Computer and Social Responsibility must be taken to satisfy the PI liberal studies requirement.

The Major Field courses for the B.S. in Computer Science consist of 18 required (4 credit) courses and 6 Major Field elective courses (or 24 credits) chosen from the list below.

The 18 required courses provide training in the following fundamental areas:

A. mathematical tools
B. problem solving, algorithms, and structured programming
C. modeling and object-oriented programming
D. computer systems

They also include:

E. the senior capstone course
F. the communication requirement

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**A. Mathematical Tools (5 Courses)**

- MAT 140 Discrete Mathematics I
- MAT 141 Discrete Mathematics II
- IT 223 Data Analysis

AND any of the following calculus sequences (160/161 or 170/171 are highly recommended):

- 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

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**B. Problem Solving, algorithms, and structured programming (3 Courses):**

- CSC 241 Introduction to Computer Science I
- CSC 242 Introduction to Computer Science II
- CSC 321 Design and Analysis of Algorithms

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**C. Modeling and Object-Oriented Programming (3 courses):**

- CSC 224 Java for Programmers Self Placement Test Available!
- CSC 383 Data Structures and Algorithms in Java
- or CSC 393 Data Structures in C++
- SE 350 Object-Oriented Software Development

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**D. Computer Systems (4 courses):**

- CSC 309 Object-Oriented Programming in C++
- CSC 373 Computer Systems I
- CSC 374 Computer Systems II
- CSC 347 Concepts of Programming Languages

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**E. Capstone :**

- CSC 394 Software Projects

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**F. Communication :**
**Major Field Elective Courses (6)**
At least 4 of the 6 Major Field elective courses (i.e. 16 out of 24 credits) must be taken from the list of "ADVANCED MAJOR FIELD COURSES" (see below).

**Introductory Major Field Courses**
- IT 130      The Internet and the Web
- IT 209      Introduction to Programming Through Animation
- IT 230      Building Internet Applications
- IT 236      User Interface Development
- IT 240      Introduction to Desktop Databases
- IT 263      Applied Networks and Security
- IM 210     Introduction to Human-Computer Interaction
- GAM 244 Game Development I
- GAM 245 Game Development II
- CSC 233 Codes and Ciphers
- CSC 235 Problem Solving

**Advanced Major Field Courses**
The courses are listed by area; there is NO requirement that the 4 courses must be from the same or from different areas.

**Theory of Computation**
- CSC 333 Cryptology
- CSC 344 Automata Theory and Formal Grammars
- CSC 389 Theory of Computation
- CSC 327 Problem Solving for Contests

**Data Storage**
- CSC 352 Database Programming
- CSC 353 Advanced Database Concepts

**Computer Systems**
- CSC 343 Introduction to Operating Systems
- CSC 348 Introduction to Compiler Design
- SE 335   Foundations of Distributed Systems I
- SE 336   Foundations of Distributed Systems II
- TDC 368  Network Programming

**Data Analysis and Mining**
- CSC 324 Data Analysis and Statistical Software II
- CSC 328 Data Analysis for Experimenters
- CSC 367 Introduction to Data Mining
- CSC 334 Advanced Data Analysis

**Computational Sciences**
- CSC 331 Scientific Computing
- CSC 387 Operations Research I: Linear Programming
- CSC 388 Operations Research II: Optimization Theory

**Artificial Intelligence**
- CSC 357 Expert Systems
- CSC 358 Symbolic Programming
- CSC 380 Foundations of Artificial Intelligence

**Computer Vision**
- CSC 381 Introduction to Digital Image Processing
- CSC 382 Applied Image Analysis
- CSC 384 Introduction to Computer Vision
Software Engineering
SE 325  Principles and Practices of Software Engineering
SE 330  Object Oriented Modeling
SE 331  Model-Driven Software Development
SE 333  Software Testing
CNS 340  Fundamentals of Information Assurance
SE 352  Object-Oriented Enterprise Application Development
SE 354  Enterprise Component Architecture
SE 356  Software Development for Mobile and Wireless Systems
SE 357  Concurrent System Development
SE 358  Software Development for Limited and Embedded Devices
SE 360  Structured Document Interchange and Processing
SE 368  Software Measurement and Project Estimation
SE 385  Software Architecture

Human-Computer Interaction
CSC 305  Graphical User Interface Implementation
IM 360  User-Centered Evaluation

Computer Graphics
GPH 325  Survey of Computer Graphics
GPH 329  Computer Graphics Development II
GPH 336  Smooth Surface Modeling for Graphics and Animation
GPH 339  Advanced Rendering Techniques
GPH 372  Principles of Computer Animation
GPH 375  Advanced Graphics Development
GPH 380  Visualization
GPH 389  Real-Time Graphics Techniques
GPH 395  Computer Graphics Senior Project

Computer Gaming
GAM 350  Physics for Game Developers
GAM 374  Action Games Programming
GAM 376  Artificial Intelligence for Computer Games
GAM 378  Strategy Games Programming
GAM 380  Console Game Development Environments
GAM 385  Introduction to Game Programming in Java
GAM 386  Game Development for Mobile Devices
GAM 390  Multiplayer Game Development
GAM 394  Game Development Project I
GAM 395  Game Development Project II

Web Development
CSC 308  Frameworks for Web Application Development
ECT 330  Advanced Internet Application Development
ECT 360  Introduction to XML
ECT 365  Web Server Operations

Computer Networks
TDC 362  Principles of Data Communications
TDC 363  Introduction to Local Area Networks
TDC 365  Network Interconnection Technologies
TDC 371  Wireless Communications Networks
TDC 372  Digital Access Services
TDC 375  Network Protocols
TDC 379  Telecommunication and Network Security Practicum

The Bachelor of Science in Computer Science: Software Engineering Concentration Program

Program Requirements
The Software Engineering (SE) Concentration consists of the 18 courses required for the BS in Computer Science (see above) together with an additional 3 required SE courses and 3 SE concentration electives Courses.
The three requires SE courses are:

SE 325 Principles and Practices of Software Engineering
SE 330 Object Oriented Modeling
SE 352 Object-Oriented Enterprise Application Development

SE Concentration Elective courses (3 courses or 12 credits):

SE 331 Model-Driven Software Development
SE 333 Software Testing
CNS 340 Fundamentals of Information Assurance
SE 335 Foundations of Distributed Systems I
CSC 305 Graphical User Interface Implementation
SE 368 Software Measurement and Project Estimation

Students taking the SE Concentration have the option of taking the below senior capstone 2 course (or 8 credits) sequence in lieu of CSC 394 (which then reduces the Open Elective list to 4 courses):
SE 391 Software Engineering Studio I
SE 392 Software Engineering Studio II

Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option. If you wish to pursue a minor, most minor field courses will be credited as open electives.

Note: Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be ‘C’ or better. Grades of ‘C-‘ may be accepted provided the overall grade point average in the major is 2.0 or better.
Four-year schedule of courses for the **Standard Concentration** :

Liberal Studies (GAM 224 is required as one of the A&L Liberal Studies Courses)

**First Year**

*Major Field Courses (5)*

- DC 201 Introduction to Screenwriting
- DC 205 Foundations of Cinema
- DC 207 History of American Cinema, 1890-1945
- DC 208 History of American Cinema, 1946-1975
- DC 209 History of American Cinema, 1976-Present

**Second Year**

*Major Field Courses (6)*

- ANI 101 Animation for Non-Majors
  or ANI 201 Animation I
- DC 210 Digital Cinema Production I
- DC 215 Digital Sound Design
- DC 220 Editing I
- DC 225 Digital Still Photography
- DC 270 Topics in Digital Cinema

**Third Year**

*Major Field Courses (6)*

- DC 275 Cinematography and Lighting
- DC 301 Advanced Screenwriting I
- DC 310 Digital Cinema Production II
- DC 311 Music Video Production
- DC 315 Advanced Digital Sound Design
- DC 320 Editing II

**Fourth Year**

*Major Field Courses (6)*

- DC 371 Documentary Production
- DC 378 Compositing and Special Effects
- DC 389 The Big Picture: the Entertainment Industry
- DC 390 Topics in Directing
- DC 395 Topics in Production
- DC 398 Digital Cinema Capstone

*Open Electives (5)*

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Four-year schedule of courses for the **Animation Concentration**

Liberal Studies
ART 106 Beginning Drawing and ART 239 20th Century Art are required as two of the three A&L Liberal Studies courses. GAM 224 Strategies in Game Design is highly recommended.

**First Year**

*Major Field Courses (7)*

- ANI 105 Intro to Visual Design
- ANI 101 Animation for Non-Majors
  or ANI 201 Animation I *
ANI 206 History of Animation
DC 201 Introduction to Screenwriting
DC 205 Foundations of Cinema
DC 220 Editing I
ART 218 Figure Drawing

*Note: ANI 201 Recommended

Liberal Studies (5) (ART 106 Required as one of LS)

Second Year

Major Field Courses (7)

ANI 220 Pre-Production Art
ANI 230 3d Modeling for Animation and Gaming
ANI 231 3d Animation for Cinema and Gaming
ANI 240 Animation II
DC 210 Digital Cinema Production I
DC 215 Digital Sound Design
DC 207 History of American Cinema, 1890-1945
or DC 208 History of American Cinema, 1946-1975
or DC 209 History of American Cinema, 1976-Present

Liberal Studies (5) (ART 239 required as one of LS)

Third Year

Major Field Courses (4)

ANI 300 3d Character Animation
ANI 340 Animation III
DC 275 Cinematography and Lighting
ART 318 Advanced Figure Drawing

Animation Electives (2)
Liberal Studies (5)
Open Electives (1)

Fourth Year

Major Field Courses (2)

ANI 350 Animation Production Studio
DC 398 Digital Cinema Capstone

NOTE: (Can substitute GAM 394 for DC 398. If GAM 394 is used, then the student MUST also take GAM 395 as an elective.)

Animation Electives (3)
Liberal Studies (4)
Open Electives (2)

Four-year schedule of courses for the Screenwriting Concentration:

First Year

Major Field Courses (5)

DC 201 Introduction to Screenwriting
DC 205 Foundations of Cinema
DC 207 History of American Cinema, 1890-1945
DC 208 History of American Cinema, 1946-1975
DC 209 History of American Cinema, 1976-Present
Second Year

Major Field Courses (5)

DC 210 Digital Cinema Production I
DC 215 Digital Sound Design
DC 220 Editing I
DC 250 Working with Actors 1
DC 270 Topics in Digital Cinema

Third Year

Major Field Courses (3)

DC 301 Advanced Screenwriting I
DC 304 Topics in Screenwriting
DC 302 Advanced Screenwriting II

Fourth Year

Major Field Courses (10)

DC 303 Advanced Screenwriting III
DC 389 The Big Picture: the Entertainment Industry
DC 390 Topics in Directing
DC 398 Digital Cinema Capstone

English Courses

Two 200 level or higher English Literature classes

Theater Courses

THE 204 History of Dramatic Literature
THE 205 History of Dramatic Literature
THE 206 History of Dramatic Literature
THE 244 Dramatic Writing for Non-Majors

Open Electives (5)

Animation Electives
Any ANI, ART, DC, GAM, GPH or IM course. EXCEPT: ART 102, ART 104, or DC 120

Open Electives

Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option (see the undergraduate Bulletin for details). If you wish to pursue a minor, most minor field courses will be credited as open electives.

Note: Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be ‘C’ or better. Grades of ‘C-’ may be accepted provided the overall grade point average in the major is 2.0 or better.

Bachelor Of Science in Digital Cinema

The Bachelor of Science program in Digital Cinema teaches students the fundamentals of motion picture theory
and history along with the technical production skills, using state-of-the-art digital technology.

The **BS degree in Digital Cinema** at DePaul CTI is an innovative program that seeks to define and to develop the evolving relationship between cinema production technologies and creative artistic expression.

The intensive technical emphasis of the Bachelor of Science degree prepares students for work in live-action special effects, 3-D animation, and game development.

The Liberal Studies program is the general education portion of the curriculum at DePaul. Click here to view the CTI courses that qualify for liberal studies credit.

GAM 224 is required as one of the A&L Liberal Studies courses.

Please note: Students must complete 20 liberal studies courses including the eight credit hour Mathematical and Technological Literacy requirement which is both ISP 120 and ISP 121. ISP 121 will replace one course from any of the six Learning Domains as long as they take at least one course in each domain.

Four-year schedule of courses:

**First Year**

*Major Field Courses (6)*

DC 201 Introduction to Screenwriting  
DC 205 Foundations of Cinema  
ANI 101 Animation for Non-Majors  
or ANI 201 Animation I  
ANI 105 Intro to Visual Design  
DC 207 History of American Cinema, 1890-1945  
DC 208 History of American Cinema, 1946-1975

*Major Field Courses (6)*

DC 210 Digital Cinema Production I  
DC 215 Digital Sound Design  
DC 220 Editing I  
ANI 230 3d Modeling for Animation and Gaming  
DC 209 History of American Cinema, 1976-Present  
DC 225 Digital Still Photography

**Third Year**

*Major Field Courses (7)*

ANI 231 3d Animation for Cinema and Gaming  
GAM 244 Game Development I  
DC 275 Cinematography and Lighting  
ANI 300 3d Character Animation  
DC 310 Digital Cinema Production II  
DC 315 Advanced Digital Sound Design  
DC 320 Editing II

**Fourth Year**

*Major Field Courses (7)*

ANI 310 Motion Capture Workshop  
GAM 245 Game Development II  
DC 375 High Definition Cinematography  
DC 378 Compositing and Special Effects  
DC 390 Topics in Directing  
DC 395 Topics in Production  
DC 398 Digital Cinema Capstone
Open Electives
Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option (see the undergraduate Bulletin for details). If you wish to pursue a minor, most minor field courses will be credited as open electives.

Note: Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be 'C' or better. Grades of 'C-' may be accepted provided the overall grade point average in the major is 2.0 or better.

Bachelor of Science in E-Commerce Technology
Modern organizations are designing and deploying Internet-based technologies for integrated e-commerce transactions. Students of the Bachelor of Science in E-Commerce Technology program learn the most in-demand internet skills for evolving new economy.

The BS in E-Commerce Technology focuses on applying Internet technologies for a wide variety of e-business solutions, including:

- online retail
- banking
- e-supply chain management
- customer relationship management
- e-government

Students learn methodologies for web engineering and project management, interactive design and e-business process/technologies. This dual emphasis of e-business concepts and technologies has resulted in plentiful job opportunities for many E-Commerce Technology graduates.

What students learn from this 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

The Liberal Studies program is the general portion of the curriculum at DePaul. Click here to view the CTI courses that qualify for liberal studies credit.

Four-year schedule of courses:

First Year
Major Field Courses (6)

IT 130 The Internet and the Web Self Placement Test Available!
IT 201 Introduction to Information Systems
IT 240 Introduction to Desktop Databases Self Placement Test Available!
IT 263 Applied Networks and Security
IT 230 Building Internet Applications
MAT 140 Discrete Mathematics I
or BMS 125 Business Calculus I

Liberal Studies (6)

Second Year

Major Field Courses (7)

IT 223 Data Analysis Self Placement Test Available!
IM 210 Introduction to Human-Computer Interaction
IT 215 Analysis and Design Techniques Self Placement Test Available!
CSC 211 Programming in Java I Self Placement Test Available!
CSC 212 Programming in Java II
ECT 330 Advanced Internet Application Development
WRD 204 Technical Writing [formerly Eng 204]
or WRD 301 Writing in the Professions

Liberal Studies (5)

Third Year

Major Field Courses (5)

ECT 355 Internet Systems: Collaboration, Commerce, and Media
ECT 360 Introduction to Xml
ECT 365 Web Server Operations
SE 330 Object Oriented Modeling
CMN 212 Small Group Communication
or CMN 220 Public Speaking

Liberal Studies (4)
Open Electives (3)

Fourth Year

Major Field Courses (2)

ECT 372 Software Project Development and Management
ECT 359 E-Commerce Technology Senior Project

300-level CTI elective (2) - chosen in consultation with student's advisor.
Liberal Studies (4)
Open Electives (4)

Open Electives

Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option (see the undergraduate Bulletin for details). If you wish to pursue a minor, most minor field courses will be credited as open electives.

Note: Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be 'C' or better. Grades of 'C-' may be accepted provided the overall grade point average in the major is 2.0 or better.
Bachelor of Science in Interactive Media

A major in Interactive Media provides students with skills and expertise for designing and producing web applications, interactive presentations and user interfaces for computer applications and a variety of consumer devices.

The Bachelor of Science in Interactive Media degree prepares students for the expanding field of interaction design and its application to multimedia and web development. The base program integrates technical and artistic disciplines. Technical concepts and skills involve web markup languages, interactive scripting and human-centered design. The student also explores artistic areas of study such as communication design, animation, game design and cinema.

What students learn from this program:

- Develop well-designed web pages, sites, and interactive applications
- Design, code and create content for casual games
- Conduct usability tests for interactive web sites
- Employ visual design principles to express ideas and concepts
- Create prototypes for interactive displays

The Liberal Studies program is the general education portion of the curriculum at DePaul. Click here to view the CTI courses that qualify for liberal studies credit.

Four-year schedule of courses:

**First Year**

*Major Field Courses (6)*

- IT 130  The Internet and the Web
- ANI 105  Intro to Visual Design
- IM 270  User-Centered Web Design
- ART 260  Art and Design I: History, Concept, Structure
- IT 240  Introduction to Desktop Databases
- ANI 101  Animation for Non-Majors
  or ANI 201  Animation I

*Liberal Studies (6) - Required: PSY 105 Introductory Psychology I and DC 205 Foundations of Cinema*

**Second Year**

*Major Field Courses (7)*

- IT 223  Data Analysis
- IT 230  Building Internet Applications
- IM 210  Introduction to Human-Computer Interaction
- IM 220  Interactive Media I
- IM 230  Scripting for Interactive Media
- ART 264 Typography I
- ANI 230  3d Modeling for Animation and Gaming

*Liberal Studies (5) - Required: CSC 208 Computers and Social Responsibility*

**Third Year**

*Major Field Courses (5)*

- IM 360  User-Centered Evaluation
IM 360      User-Centered Evaluation
IM 330      Advanced Scripting for Interactive Media
WRD 204 Technical Writing [formerly Eng 204]
GAM 244  Game Development I

**IM Electives** (3)

**Liberal Studies** (4)

**Fourth Year**

**Major Field Courses** (1)

IM 394 Human-Computer Interaction Capstone Course
or CSC 394 Software Projects

**IM Electives** (2) - chosen in consultation with student's advisor

**Liberal Studies** (4)

**Open Electives** (5)

**IM Electives**
Any 200 or 300 level CTI, ART or CMN course.

Any of the following:
- PSY 360 Theories of Learning and Cognition
- PSY 375 Sensation and Perception
- PSY 380 Industrial and Organizational Psychology
- PSY 383 Psychology of Design
- PSY 241 Research Methods I
- PSY 242 Research Methods II

**Open Electives**
Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option (see the undergraduate Bulletin for details). If you wish to pursue a minor, most minor field courses will be credited as open electives.

**Note:** Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be 'C' or better. Grades of 'C-' may be accepted provided the overall grade point average in the major is 2.0 or better.

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**Bachelor of Science in Information Assurance and Security Engineering**

The **Bachelor of Science in Information Assurance and Security Engineering** prepares students to evaluate and manage an organization's computer, information and network security, as well as develop a solid information technology infrastructure.

A student in the **BS in Information Assurance and Security Program** will learn the fundamentals of information security and security engineering, security infrastructure design and implementation as well as the impact of security requirements on a business operation.

The BS in IASE program also emphasizes hands-on experience. IASE students learn to design, implement and manage various security infrastructure components in our state-of-the-art Information Assurance and Security Laboratory. The lab environment includes multi-vendor firewalls, Virtual Private Networks, Intrusion Detection and Prevention systems, routers, switches and event correlation systems.
What students learn from this program:

- Fundamentals of information assurance
- Risk assessment
- Network security
- Computer forensics
- Application development

The Liberal Studies program is the general education portion of the curriculum at DePaul. Click here to view the CTI courses that qualify for liberal studies credit.

Four-year schedule of courses:

**First Year**

**Major Field Courses (6)**

IT 130 The Internet and the Web [Self Placement Test Available]
IT 240 Introduction to Desktop Databases [Self Placement Test Available]
IT 263 Applied Networks and Security
IT 230 Building Internet Applications
CSC 233 Codes and Ciphers
MAT 140 Discrete Mathematics I

**Liberal Studies (6)**

**Second Year**

**Major Field Courses (7)**

CSC 211 Programming in Java I [Self Placement Test Available]
and CSC 212 Programming in Java II
or CSC 261 Programming Languages I: C/C++
and CSC 262 Programming Languages II: C/C++
CSC 373 Computer Systems I
CNS 340 Fundamentals of Information Assurance (ex CSC 390)
TDC 362 Principles of Data Communications
TDC 365 Network Interconnection Technologies
WRD 204 Technical Writing [formerly ENG 204]

**Liberal Studies (5)**

**Third Year**

**Major Field Courses (4)**

TDC 377 Fundamentals of Network Security
IT 378 Host and Information Security
CNS 320 Computer Forensic and Incident Response
CMN 212 Small Group Communication
or CMN 220 Public Speaking

300-level CTI elective (1) - chosen in consultation with student's advisor.
**Liberal Studies (7)**

**Fourth Year**

**Major Field Courses (6)**

SE 325 Principles and Practices of Software Engineering [Self Placement Test Available]
TDC 379 Telecommunication and Network Security Practicum
CNS 228 Legal, Ethical and Social Issues in Information Security
CNS 394 Information Systems Security Engineering I
CNS 394 Information Systems Security Engineering I
ACC 101 Introduction to Accounting I
or FIN 290 Finance for Non-Commerce Majors

300-level CTI elective (1) - chosen in consultation with student's advisor.
Liberal Studies (1)
Open Electives (4)

Open Electives
Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option (see the undergraduate Bulletin for details). If you wish to pursue a minor, most minor field courses will be credited as open electives.

Note: Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be ‘C’ or better. Grades of ‘C-' may be accepted provided the overall grade point average in the major is 2.0 or better.

Bachelor of Science in Information Systems

The Bachelor of Science in Information Systems program emphasizes both technical and managerial expertise. Its graduates start their careers in IT project management, systems analysis & design, database administration, helpdesk, enterprise systems administration, and user training.

DePaul CTI’s BS in Information Systems provides students with a solid and diverse foundation in information technology, preparing for the changing technology demands of the business world.

The program is focused on the organizational and business application of computers and related technologies. Students within the IS program apply their knowledge of hardware, software, business processes and procedures to help organizations improve their performance and meet tactical and strategic goals.

What students learn from this program:

- systems analysis and design skills
- IT project management skills
- supply chain management (SCM) and customer relationship management (CRM)
- knowledge of enterprise systems
- knowledge of systems architecture and design

The Liberal Studies program is the general education portion of the curriculum at DePaul. Click here to view the CTI courses that qualify for liberal studies credit.

Four-year schedule of courses:

First Year

Major Field Courses (5)

IT 130 The Internet and the Web Self Placement Test Available!
IT 201 Introduction to Information Systems
IT 240 Introduction to Desktop Databases Self Placement Test Available!
IT 263 Applied Networks and Security
IT 230 Building Internet Applications
Second Year

Major Field Courses (7)

IT 223 Data Analysis Self Placement Test Available!
IM 210 Introduction to Human-Computer Interaction
IT 215 Analysis and Design Techniques Self Placement Test Available!
CSC 211 Programming in Java I Self Placement Test Available!
ACC 101 Introduction to Accounting I
or MKT 301 Principles of Marketing
CMN 212 Small Group Communication
or CMN 220 Public Speaking
WRD 204 Technical Writing [formerly Eng 204]
or WRD 301 Writing in the Professions

Third Year

Major Field Courses (5)

IT 236 User Interface Development
CSC 212 Programming in Java II
IS 371 Introduction to I.T System Management
IS 372 Fundamentals of Software Project Management
IS 373 Introduction to Large Systems Implementation

Fourth Year

Major Field Courses (3)

CNS 340 Fundamentals of Information Assurance : (Formerly CSC390)
IS 375 Object-Oriented Analysis and Design
IS 376 Information Systems Project

300-Level CTI electives (2) - chosen in consultation with your advisor.

Liberal Studies (3)
Open Electives (4)

Open Electives

Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option (see the undergraduate Bulletin for details). If you wish to pursue a minor, most minor field courses will be credited as open electives.

Note: Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be 'C' or better. Grades of 'C-' may be accepted provided the overall grade point average in the major is 2.0 or better.
The Bachelor of Arts degree in Information Technology program will give students a broad education in current areas of information technology, with a focus on producing educated and sophisticated consumers of information technology. They will acquire:

- An understanding of the impact of information and communication technologies on social, cultural, and ethical dimensions.
- Strong quantitative and reasoning skills with the ability to present technical data in verbal, written, and graphical forms.
- Verbal and written communication literacy.
- Students will also have an opportunity to specialize in a domain of interest or to acquire a generalized education in information technology.

The Liberal Studies program is the general education portion of the curriculum at DePaul. Click here to view the CTI courses that qualify for liberal studies credit.

Four-year schedule of courses:

**First Year**

*Major Field Courses (4)*

- IT 130  The Internet and the Web [Self Placement Test Available!](#)
- IT 201  Introduction to Information Systems
- IT 240  Introduction to Desktop Databases [Self Placement Test Available!](#)
- ICS 200  Introduction to Business

*Liberal Studies (7)*

*Open Elective (1)*

**Second Year**

*Major Field Courses (6)*

- IT 230  Building Internet Applications [Self Placement Test Available!](#)
- IT 223  Data Analysis [Self Placement Test Available!](#)
  or CSC 239  Personal Computing
- IM 210  Introduction to Human-Computer Interaction
- IT 263  Applied Networks and Security
  or TDC 361  Basic Communication Systems
- CSC 223  The Impact of Computing Technology On Our Lives
- CMN 212  Small Group Communication
  or CMN 220  Public Speaking

*Liberal Studies (6)*

**Third Year**

*Major Field Courses (4)*

- WRD 204  Technical Writing [formerly ENG 204]
  or WRD 301  Writing in the Professions

3 Technical Grounding Courses from this list:

- IT 236  User Interface Development
- IT 215  Analysis and Design Techniques [Self Placement Test Available!](#)
- CSC 211  Programming in Java I [Self Placement Test Available!]
- CSC 212  Programming in Java II
- CSC 261  Programming Languages I: C/C++
- CSC 262  Programming Languages II: C/C++
- ECT 330  Advanced Internet Application Development
- TDC 363  Introduction to Local Area Networks
- GPH 211  Perceptual Principles for Digital Environments I

[Self Placement Test Available!](#)
GPH 211 Perceptual Principles for Digital Environments I
GAM 244 Game Development I
GAM 245 Game Development II
SE 325 Principles and Practices of Software Engineering Self Placement Test Available!

300-Level CTI Electives (1)
Any DePaul Class 200-level and higher (2)
Liberal Studies (5)

Fourth Year

Major Field Courses (1)

SOC 394 Sociology and Society (Satisfies the Junior Experiential Learning requirement)
CSC 378 Software Projects for Community Clients

Any 200-level or higher DePaul Elective (3)
300-level CTI Electives (2)
Open Electives (5)

Open Electives
Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option (see the undergraduate Bulletin for details). If you wish to pursue a minor, most minor field courses will be credited as open electives.

Note: Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be 'C' or better. Grades of 'C-' may be accepted provided the overall grade point average in the major is 2.0 or better.

School of Computer Science, Telecommunications & Information Systems - Undergraduate Studies ▪ Academic Programs ▪ Bachelor of Science in Information Technology

Bachelor of Science in Information Technology

The Bachelor of Science in Information Technology is a technical degree that instructs students in core competencies in the areas of problem solving and programming, networks and communications systems, databases, internet and Web technologies, security, and project management. Students also receive a solid academic foundation in business concepts and technical communication.

The Liberal Studies program is the general education portion of the curriculum at DePaul. Click here to view the CTI courses that qualify for liberal studies credit.

Four-year schedule of courses:

First Year

Major Field Courses (6)

IT 130 The Internet and the Web Self Placement Test Available
IT 240 Introduction to Desktop Databases Self Placement Test Available
IT 263 Applied Networks and Security
IT 230 Building Internet Applications Self Placement Test Available
CSC 211 Programming in Java I Self Placement Test Available
and CSC 212 Programming in Java II
or CSC 261 Programming Languages I: C/C++
and CSC 262 Programming Languages II: C/C++
or CSC 241 Introduction to Computer Science I
and CSC 242 Introduction to Computer Science II

**Liberal Studies (6)**

**Second Year**

**Major Field Courses (7)**

CSC 309  Object-Oriented Programming in C++ (Take this if you took the JAVA sequence.)  
or CSC 224 Java for Programmers (Take this if you took C++ programming.) **Self Placement Test Available!**  
CSC 383  Data Structures and Algorithms in Java  
or CSC 393 Data Structures in C++  
CSC 352  Database Programming  
IT 215  Analysis and Design Techniques **Self Placement Test Available**  
IT 223  Data Analysis **Self Placement Test Available!**  
MAT 140  Discrete Mathematics I  
WRD 204 Technical Writing [formerly Eng 204]  
or WRD 301 Writing in the Professions [prereq: ENG 104 or WRD 104]

**Liberal Studies (5)**

**Third Year**

**Major Field Courses (6)**

IT 378  Host and Information Security  
CSC 373 Computer Systems I  
or ECT 365 Web Server Operations  
or TDC 311 Computers in Telecommunications Systems  
IS 372  Fundamentals of Software Project Management  
CMN 212 Small Group Communication  
or CMN 220 Public Speaking  
MKT 301  Principles of Marketing

(1) of the 4 CTI Electives of which at least 3 must be 300-level and at most one could be chosen from the restricted list below  
**Liberal Studies (5) Required: ECO 105 Principles of Microeconomics**

**Fourth Year**

**Major Field Courses (5)**

ACC 101 Introduction to Accounting I  
or FIN 290 Finance for Non-Commerce Majors

(3) of the 4 CTI Electives of which 3 must be 300-level and at most one could be chosen from the restricted list below.  
**Capstone (Any CTI Capstone)**  
**Liberal Studies (3)**  
**Open Electives (5)**

**Restricted List of CTI Electives** (Only 1 CTI Elective can come from this list):  
IM 210  Introduction to Human-Computer Interaction  
IM 270  User-Centered Web Design  
GPH 211  Perceptual Principles for Digital Environments I  
GPH 212  Perceptual Principles for Digital Environments II  
GPH 213  Perceptual Principles for Digital Environments III  
GPH 250  Digital Modeling I  
GPH 259  Design Geometry  
GAM 244  Game Development I  
GAM 245  Game Development II  
ANI 201  Animation I  
ANI 230  3d Modeling for Animation and Gaming  
ANI 231  3d Animation for Cinema and Gaming
Open Electives
Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option (see the undergraduate Bulletin for details). If you wish to pursue a minor, most minor field courses will be credited as open electives.

Note: Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be ‘C’ or better. Grades of ‘C-‘ may be accepted provided the overall grade point average in the major is 2.0 or better.
IT 223  Data Analysis  Self Placement Test Available!
TDC 311  Computers in Telecommunications Systems
TDC 362  Principles of Data Communications
WRD 204 Technical Writing [formerly Eng 204]
or WRD 301 Writing in the Professions
CSC 211  Programming in Java I  Self Placement Test Available!
and CSC 212 Programming in Java II
OR CSC 261 Programming Languages I: C/C++
and CSC 262 Programming Languages II: C/C++

Liberal Studies (6)

**Third Year**

Major Field Courses (5)

TDC 363  Introduction to Local Area Networks
TDC 364  Voice Communications Technologies
TDC 365  Network Interconnection Technologies
CMN 212  Small Group Communication
or CMN 220  Public Speaking

(1) 300-level TDC elective chosen in consultation with student's advisor.
Liberal Studies (4)
Open Electives (3)

**Fourth Year**

Major Field Courses (3)

TDC 376  Network Project

(2) 300-level TDC electives chosen in consultation with student's advisor.
Liberal Studies (3)
Open Electives (6)

Four-year schedule of courses for the **Network Security Concentration**:

**First Year**

Major Field Courses (6)

IT 130  The Internet and the Web  Self Placement Test Available!
IT 201  Introduction to Information Systems
IT 240  Introduction to Desktop Databases  Self Placement Test Available!
IT 263  Applied Networks and Security
IT 230  Building Internet Applications
MAT 140  Discrete Mathematics I

Liberal Studies (6)

**Second Year**

Major Field Courses (6)

CSC 261  Programming Languages I: C/C++
CSC 262  Programming Languages II: C/C++
TDC 311  Computers in Telecommunications Systems
TDC 362  Principles of Data Communications
CNS 340  Fundamentals of Information Assurance: (Formerly CSC 390).
WRD 204 Technical Writing [formerly Eng 204]
or WRD 301 Writing in the Professions
Liberal Studies (6)

Third Year

Major Field Courses (5)

TDC 363  Introduction to Local Area Networks
TDC 365  Network Interconnection Technologies
TDC 377  Fundamentals of Network Security
CMN 212 Small Group Communication
or CMN 220 Public Speaking

(1) 300-level TDC elective chosen in consultation with student's advisor.

Liberal Studies (7)

Fourth Year

Major Field Courses (6)

IT 378      Host and Information Security
TDC 379  Telecommunication and Network Security Practicum
TDC 375  Network Protocols
TDC 368  Network Programming
TDC 376  Network Project

(1) 300-level TDC elective chosen in consultation with student's advisor.

Open Electives (6)

Four-year schedule of courses for the Application Development Concentration:

First Year

Major Field Courses (6)

IT 130    The Internet and the Web Self Placement Test Available!
IT 201     Introduction to Information Systems
IT 240     Introduction to Desktop Databases Self Placement Test Available!
IT 263     Applied Networks and Security
IT 230     Building Internet Applications
MAT 140 Discrete Mathematics I

Liberal Studies (6)

Second Year

Major Field Courses (6)

IT 223     Data Analysis
TDC 311   Computers in Telecommunications Systems
TDC 362    Principles of Data Communications
CSC 211    Programming in Java I
or CSC 261 Programming Languages I: C/C++
CSC 212    Programming in Java II
or CSC 262 Programming Languages II: C/C++
WRD 204    Technical Writing [formerly Eng 204]
or WRD 301 Writing in the Professions [prereq: ENG 104 or WRD 104]

Liberal Studies (6)

Third Year

Major Field Courses (7)

TDC 363  Introduction to Local Area Networks
TDC 365  Network Interconnection Technologies
CSC 309 Object-Oriented Programming in C++
or CSC 224 Java for Programmers Self Placement Test Available!
CSC 383 Data Structures and Algorithms in Java
or CSC 393 Data Structures in C++
TDC 368 Network Programming
CMN 212 Small Group Communication
or CMN 210 Interpersonal and Small Group Communication

(1) 300-level TDC elective chosen in consultation with student's advisor.
Liberal Studies (4)
Open Electives (1)

Fourth Year

Major Field Courses (3)

TDC 375 Network Protocols
TDC 376 Network Project

(1) 300-level TDC elective chosen in consultation with student's advisor.
Liberal Studies (3)
Open Electives (6)

Open Electives

Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option (see the undergraduate Bulletin for details). If you wish to pursue a minor, most minor field courses will be credited as open electives.

Note: Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be 'C' or better. Grades of 'C-' may be accepted provided the overall grade point average in the major is 2.0 or better.

School of Computer Science, Telecommunications & Information Systems - Undergraduate Studies ▷ Academic Programs ▷ Bachelor of Science in Mathematics / Computer Science

Bachelor of Science in Mathematics / Computer Science

Exceptional students with an interest in the highly theoretical nexus of math and computer science will find challenging opportunities from the BS in Math and Computer Science degree.

Mathematics are a key element to the theory and practice of computer science and technology:

- Number theory forms the basis for encryption algorithms for messages sent over the Internet.
- Facts from projective geometry and multivariable calculus underlie the computer algorithms that control computer animation.
- Properties of abstract groups are instrumental in correcting transmission errors that occur when information is sent from one computer to another.
- Graph theory and combinatorics are used to create algorithms for Internet search engines and analyze Internet routing protocols.

Graduates of this joint major program is intended to appeal to academically talented students. It is designed to prepare them for graduate study in various areas of computer science such as theoretical computer science, graphics, data analysis, artificial intelligence, and computational methods and in areas in applied mathematics such as numerical analysis or discrete mathematics.

The program is also designed to prepare students to complete for the more theoreticall complex jobs found in computer software development.

What students learn from the program:
It is highly recommended that students concentrate on one or two areas for their advanced classes to achieve depth, but they are not required to do so. Faculty advisors are available to assist students in their selection.

The BS in Math and Computer Science consists of five parts:

- The DePaul Liberal Studies program (19 courses, not including the capstone course).
  - Freshman and Sophomore Core: 5 courses
  - Learning Domains: 13 courses
  - Junior Year Experiential Learning Course

  Click here to view the CTI courses that qualify for liberal studies credit.

- Core Classes (14 courses)
- Advanced Classes (7 courses)
- Capstone (1 course)
- Open Electives (7 courses)

**CORE CLASSES**

**Mathematical Foundations**

MAT 140 Discrete Mathematics I
MAT 141 Discrete Mathematics II
MAT 260 Multivariable Calculus I
MAT 262 Linear Algebra

In addition, students must complete one of the following three-course sequences:

MAT 150 Calculus I
AND MAT 151 Calculus II
AND MAT 152 Calculus III

or

MAT 160 Calculus for Mathematics and Science Majors I
AND MAT 161 Calculus for Mathematics and Science Majors II
AND MAT 162 Calculus for Mathematics and Science Majors III

or

MAT 170 Calculus I with Scientific Applications
AND MAT 171 Calculus II with Scientific Applications
AND MAT 172 Calculus III with Differential Equations

(MAT 147, MAT 148 and MAT 149 may also be used to satisfy this requirement)

**Problem Solving, algorithms, and structured programming**

CSC 241 Introduction to Computer Science I
CSC 242 Introduction to Computer Science II
CSC 321 Design and Analysis of Algorithms
CSC 383 Data Structures and Algorithms in Java
or CSC 393 Data Structures in C++

**Object-Oriented Programming**

CSC 224 Java for Programmers Self Placement Test Available!
or CSC 309 Object-Oriented Programming in C++
Advanced Classes (7 Courses)

Students can choose advanced computer science and mathematics classes from different areas including theory of computation, computational mathematics, artificial intelligence, data analysis, graphics, and computer vision. It is recommended that students concentrate on one or two areas for their advanced classes to achieve depth, but they are not required to do so. Students are strongly encouraged to discuss course selection with an advisor.

Students choose seven courses from the following area lists. At least three of the courses have to be in computer science (or graphics) and at least three in mathematics. Courses not on this list need to be approved by an advisor. In particular, students may wish to arrange with a professor to take an independent study or a research experience (MAT 399 or CSC 399 or IT 300) in order to explore a subject more deeply than is possible in a scheduled course.

Theory of Computation Area

The courses in the theory area explore the mathematical and logical foundations of computer science.

MAT 302 Combinatorics
MAT 303 Theory of Numbers [prereq
MAT 351 Probability and Statistics I
MAT 310 Abstract Algebra I [prereq
MAT 311 Abstract Algebra II
MAT 312 Abstract Algebra III
MAT 335 Real Analysis I [prereq
MAT 372 Logic and Set Theory
CSC 235 Problem Solving
CSC 327 Problem Solving for Contests
CSC 333 Cryptology
CSC 344 Automata Theory and Formal Grammars
CSC 347 Concepts of Programming Languages
CSC 348 Introduction to Compiler Design
CSC 387 Operations Research I: Linear Programming
or MAT 387 Operations Research I: Linear Programming
CSC 389 Theory of Computation
CSC 358 Symbolic Programming

Computational Methods Area

The computational methods area investigates quantitative and computational methods in computer science.

CSC 331 Scientific Computing
CSC 385 Numerical Analysis
or MAT 385 Numerical Analysis I
CSC 386 Advanced Numerical Analysis
or MAT 386 Numerical Analysis II
MAT 330 Methods of Computation and Theoretical Physics I
MAT 331 Methods of Computation and Theoretical Physics II
MAT 384 Mathematical Modeling

Artificial Intelligence Area

For students with an interest in the computational relations between syntax and semantics.

CSC 380 Foundations of Artificial Intelligence
CSC 357 Expert Systems
CSC 358 Symbolic Programming

Data Analysis Area
For Students who are interested in statistical and computational Analysis of data. Many of the courses in this area require the student to take MAT 351-353.

- CSC 328 Data Analysis for Experimenters
- CSC 334 Advanced Data Analysis
- **or** MAT 354 Multivariate Statistics
- CSC 332 Simulation and Modeling
- **or** MAT 359 Simulation Models and the Monte Carlo Method
- CSC 367 Introduction to Data Mining
- MAT 261 Multivariable Calculus II
- MAT 351 Probability and Statistics I
- MAT 352 Probability and Statistics II
- MAT 353 Probability and Statistics III
- MAT 355 Stochastic Processes
- MAT 357 Nonparametric Statistics
- MAT 370 Advanced Linear Algebra
- MAT 356 Applied Regression Analysis
- MAT 358 Applied Time Series and Forecasting

**Graphics Area**
The graphics courses are intended for students who want to study the technical and mathematical foundations of computer graphics and animation.

- MAT 337 Complex Analysis
- MAT 261 Multivariable Calculus II
- MAT 370 Advanced Linear Algebra
- CSC 385 Numerical Analysis
- **or** MAT 385 Numerical Analysis I
- GPH 211 Perceptual Principles for Digital Environments I
- GPH 212 Perceptual Principles for Digital Environments II
- GPH 325 Survey of Computer Graphics
- GPH 329 Computer Graphics Development II
- GPH 336 Smooth Surface Modeling for Graphics and Animation
- GPH 372 Principles of Computer Animation

**Computer Vision Area**
Computer vision studies the mathematical and algorithmic underpinnings of image analysis and image processing.

- MAT 261 Multivariable Calculus II
- MAT 335 Real Analysis I [prereq
- MAT 381 Fourier Analysis and Special Functions
- MAT 370 Advanced Linear Algebra
- MAT 384 Mathematical Modeling
- CSC 381 Introduction to Digital Image Processing
- CSC 382 Applied Image Analysis
- CSC 384 Introduction to Computer Vision

**CAPSTONE COURSES**
Students can choose from several capstone courses, depending on their interest and coursework:

- CSC 378 Software Projects for Community Clients
- CSC 394 Software Projects
- GPH 395 Computer Graphics Senior Project
- MAT 398 Senior Capstone Seminar

Students need to make sure that they cover all prerequisites of their respective capstone (possibly using open electives).

**OPEN ELECTIVES**
Students choose seven (7) open electives. Open Electives may be taken from any department or program. These are the only courses that may be taken under the pass/fail option (see the undergraduate Bulletin for details). If you wish to pursue a minor, most minor field courses will be credited as open electives.

**Note:** Grades for all courses in the students major (i.e. non-Liberal Studies and non-Open Elective) must be ‘C’ or better. Grades of ‘C-’ may be accepted provided the overall grade point average in the major is 2.0 or better.

Accelerated Degrees

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**Bachelor of Arts in Computing**

The Bachelor of Arts in Computing is offered jointly by the School of Computer Science, Telecommunications and Information Systems and the School for New Learning. This degree is designed for working adults at least 24 years of age, who wish to obtain credit for their careers as technology professionals, and gain new skills in problem-solving, design, testing and communicating. The BA in Computing differs from the BS in Computer Science in that the BS places heavier emphasis on traditional programming and formal algorithmic analysis. The BA in computing program focuses on relating program design and computing to organizational dynamics and human relations. It helps to prepare students to analyze and negotiate the social, ethical, and technological systems of a business and to act as a liaison between the technical and non-technical sides of a company.

The computer competences in the BA in Computing program cover a variety of topics directly related to current industry practice. These competences include skills and knowledge in information systems, data communications, databases, software engineering, and the design and evaluation of user interfaces. In the general studies area of the program, competences are tied to the humanities, the natural sciences and the social sciences. Students may select competences in the arts, design, ecology, human biology, multicultural relations, and politics and so on that are tailored to their individual goals and interests. The BA in Computing is completed by satisfying a total of fifty (50) competences; this amounts to the equivalent of 140 quarter hours. Typically these competences are satisfied through course work or equivalent work experience.

For a copy of the Program Guide for the Bachelor of Arts in Computing or to make reservations for a BA in Computing Information Session, please call either the School of Computer Science, Telecommunications and Information Systems at (312)362-8381 or the School for New Learning at (312)362-8001.

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**Accelerated Degrees**

**BS/MS Accelerated Programs available for current CTI Students**

The Combined Degree Programs at CTI are designed to allow academically gifted students to complete both a bachelor and master's degree in a shorter amount of time than by taking each degree separately.

Please note: This version of the degree replaces all previous combinations and current students will be migrated to this plan.

**Combined Degree Program Structure**

The shortened structure of combines degree programs is accomplished by students taking three Masters level
The shortened structure of combined degree programs is accomplished by students taking three Master’s level courses in their junior and senior year that count toward both their bachelor and master’s degree requirements at the same time. Students in this program will receive both a bachelor degree, after 192 undergraduate credit hours, and a masters degree after 10 more graduate courses (40 hours), instead of the standard 13 (52 hours).

How to apply:

In order to apply for the BS/MS program, your faculty advisor must send an e-mail recommendation to Becky Krochmal at bkrochmal@cti.depaul.edu. The recommendation should include, the student full name, id number and the BS and MS degrees you wish to apply for.

Admission criteria are as follows:

- Minimum of 6 course/24 credit hours completed
- GPA of 3.3 or higher
- Endorsement of faculty advisor - this should be sent via e-mail to bkrochmal@cti.depaul.edu

Maintaining Good Standing

- Maintain GPA of 3.3 or higher
- Earn a B- minimum in each graduate prerequisite course taken
- Earn at least the minimum grade required in all graduate courses taken (see specific programs for details)
- If a student does not maintain good standing, they will be dismissed from the Combined Degree and returned to normal undergraduate degree seeking status. Any graduate courses passed before dismissal will not be counted toward graduate credit and may not be retaken (if the student does pursue graduate study, other graduate courses must be substituted). If dismissed students wish to apply to a CTI graduate degree program, they may do so following normal CTI admissions procedures, but will still be required to take 13 graduate courses for a MS degree.

Designing a Course of Study

It is extremely important that the student and faculty advisor work together on a course of study immediately upon admission to the Combined Degree Program.

This course of study may include which undergraduate classes to avoid taking in order to take the graduate version. Failure to put together a solid plan can lead to extra coursework and a lengthening of the Combined Degree program.

It is advisable for the student and advisor to enter the proposed plan of study in the student communication record on the CTI intranet so it is available to the student and CTI faculty and staff.
Minors

A minor is a combination of courses that provides a cohesive introduction to an area of study. Typically, courses taken to satisfy minor field requirements are credited as open electives; however, there are some instances where minor field courses may be used for credit in other areas of the students curriculum. Grades for all courses, taken to fulfill a minor field requirement must be C or above. Grades of C- may be accepted for credit in the minor provided the minor GPA is 2.0 or above. A minimum of one-half of the courses required for a minor must be completed at DePaul University.

MINORS IN THE COLLEGE OF COMMERCE

Students enrolled in the School of Computer Science, Telecommunications and Information Systems (CTI) may obtain a minor in Accounting, Business Administration, E-Business, Economics, Management, MIS, Marketing, and Pre-MBA. Please see the College of Commerce Section for Minor Requirements.

MINORS IN THE COLLEGE OF LIBERAL ARTS AND SCIENCES

Students enrolled in the School of Computer Science, Telecommunications and Information Systems (CTI) may obtain a minor through the College of Liberal Arts and Sciences. Most Liberal Arts and Science departments offer minor concentrations of study. In general, a minor in a Liberal Arts and Sciences discipline consists of a set of introductory courses plus another set of more specialized courses. Most minors require six courses, some of which may also be used for credit in the Liberal Studies Program. For a complete list of minors offered through the College of Liberal Arts and Sciences, please consult that section of this online Bulletin.

MINORS IN THE COLLEGE OF COMPUTER SCIENCE, TELECOMMUNICATIONS AND INFORMATION SYSTEMS

Minors Within CTI for CTI Students

To obtain a minor in CTI when the major is also in CTI:
1. Satisfy all requirements for the major
2. Satisfy all requirements for the minor
3. Students must take at least 6 courses in the minor area that do not count towards their CTI major

Note: If you have already taken some of the courses listed under your minor on this page, work with your advisor to choose other courses within the same program area, ie. NT minor would look under NT major courses and Computer Graphics Software Development would look under Computer Graphics Courses, in order to have 6 distinct courses.

It is obvious that computers are becoming an ever more ubiquitous part of our world. They are used in all academic disciplines, from physics to history to geography. To get the most out of your degree, why not try a minor in CTI? CTI offers several minors that will appeal to you.

Political science and geography majors, you could learn about databases and data analysis which is important to understanding how to analyze census or GPS data.

Communications majors, you might be interested in digital cinema which will give you skills in creating videos for advertising.

Art majors, you know that animators are moving to computers, so if you are interested in animation, we have a computer graphics minor for you.

Commerce students, grounding in e-commerce technology, networks or information systems could give you an edge in a tough job market.
There are other examples too numerous to mention. So if you have questions or want advice on what minor is best for you, can email our CTI Undergraduate Services team: gocti@cti.depaul.edu or call them at: 312-362-8714.

**Policies for Academic Minors**

Students must:

1. earn at least a grade of C- in each minor course and a GPA of no less than 2.0 for all courses in the minor;
2. earn at least a cumulative GPA of 2.0 for all courses applied to the minor;
3. not select the pass/fail option for courses in the minor
4. meet the following residency requirement: no more than 50% of the requirements of a minor may be fulfilled by transfer credits, AP credit, IB credit of CLEP credit.

Finally, studies cannot earn a minor in their major program. Courses required to fulfill a minor are determined by the unit in which the minor resides.

- Animation Minor
- Computer Graphics Software Development
- Computer Science
- Data Analysis and Data Mining
- Database
- Data Visualization Development
- Digital Cinema
- E-Commerce Technology
- Game Design
- Game Programming
- Interactive Media
- Information Systems
- Information Technology
- Network Technologies
- Security
- Software Engineering
- Visual Computing

**CTI Minor Requirements for Non-CTI Majors**

**Animation Minor**

ANI 101 Animation for Non-Majors
ANI 230 3d Modeling for Animation and Gaming
ANI 231 3d Animation for Cinema and Gaming
ANI 206 History of Animation

3 courses from the following list:
ANI 220 Pre-Production Art
ANI 300 3d Character Animation
ANI 310 Motion Capture Workshop
DC 201 Introduction to Screenwriting
DC 205 Foundations of Cinema

**Computer Graphics Software Development Minor**

**Liberal Studies**

GPH 211 Perceptual Principles for Digital Environments I
GPH 212 Perceptual Principles for Digital Environments II

**Course Requirements**

CSC 261 Programming Languages I: C/C++
CSC 262 Programming Languages II: C/C++
CSC 393 Data Structures in C++
GPH 329 Computer Graphics Development II
GPH 339 Advanced Rendering Techniques
GPH 372 Principles of Computer Animation

**Computer Science Minor**

CSC 241 Introduction to Computer Science I
and CSC 242 Introduction to Computer Science II
and CSC 224 Java for Programmers
or
CSC 211 Programming in Java I
and CSC 212 Programming in Java II
and CSC 309 Object-Oriented Programming in C++
or
CSC 261 Programming Languages I: C/C++
and CSC 262 Programming Languages II: C/C++
and CSC 224 Java for Programmers
CSC 393 Data Structures in C++
or
CSC 383 Data Structures and Algorithms in Java
MAT 140 Discrete Mathematics I
CSC 373 Computer Systems I
CSC 374 Computer Systems II

**Data Analysis and Data Mining Minor**

IT 240 Introduction to Desktop Databases
IT 223 Data Analysis
CSC 324 Data Analysis and Statistical Software II
CSC 367 Introduction to Data Mining
CSC 334 Advanced Data Analysis
2 CTI Electives

**Database Minor**

CSC 211 Programming in Java I
CSC 212 Programming in Java II
IT 223 Data Analysis
IT 240 Introduction to Desktop Databases
CSC 352 Database Programming
CSC 367 Introduction to Data Mining
1 CTI Elective

**Data Visualization Development Minor**

**Liberal Studies**

GPH 211 Perceptual Principles for Digital Environments I
GPH 212 Perceptual Principles for Digital Environments II

**Course Requirements**

CSC 261 Programming Languages I: C/C++
CSC 262 Programming Languages II: C/C++
CSC 323 Data Analysis
CSC 393 Data Structures in C++
GPH 329 Computer Graphics Development II
GPH 372 Principles of Computer Animation
GPH 380 Visualization

**Digital Cinema Minor**

DC 205 Foundations of Cinema
DC 205 Foundations of Cinema
DC 225 Digital Still Photography
DC 201 Introduction to Screenwriting
DC 220 Editing I

3 courses from the following list:
ANI 101 Animation for Non-Majors
DC 210 Digital Cinema Production I
DC 270 Topics in Digital Cinema
GAM 224 Introduction to Game Design
DC 215 Digital Sound Design
DC 275 Cinematography and Lighting
DC 310 Digital Cinema Production II
DC 320 Editing II
DC 389 The Big Picture: the Entertainment Industry

**E-Commerce Technology Minor**

IT 130 The Internet and the Web
CSC 211 Programming in Java I
CSC 212 Programming in Java II
IT 230 Building Internet Applications
ECT 330 Advanced Internet Application Development
IM 210 Introduction to Human-Computer Interaction

1 course from the following list:
ECT 355 Internet Systems: Collaboration, Commerce, and Media
ECT 360 Introduction to Xml
ECT 365 Web Server Operations

**Game Design Minor**

DC 201 Introduction to Screenwriting
ANI 105 Intro to Visual Design
ANI 101 Animation for Non-Majors
or ANI 201 Animation I
ANI 230 3d Modeling for Animation and Gaming
GAM 224 Introduction to Game Design
GAM 244 Game Development I
GAM 245 Game Development II

**Game Programming Minor**

GAM 224 Introduction to Game Design
GAM 244 Game Development I
GAM 245 Game Development II
GAM 374 Action Games Programming

Two of:
ANI 230 3d Modeling for Animation and Gaming
GPH 321 Computer Graphics Development I
GPH 329 Computer Graphics Development II
GPH 350 Digital Modeling II
Any other 300-level GAM or GPH course

**Interactive Media Minor**

**Required Courses**

IM 210 Introduction to Human-Computer Interaction
IM 220 Interactive Media I
IM 230 Scripting for Interactive Media
IM 270 User-Centered Web Design
Plus any three of the following:
IM 320 Interactive Media II
IM 330 Advanced Scripting for Interactive Media
IM 360 User-Centered Evaluation
ANI 101 Animation for Non-Majors
ANI 105 Intro to Visual Design
ART 260 Art and Design I: History, Concept, Structure
ART 264 Typography I
DC 205 Foundations of Cinema
GAM 244 Game Development I
IT 130 The Internet and the Web
IT 230 Building Internet Applications

**Information Systems Minor**

CSC 211 Programming in Java I
IT 230 Building Internet Applications
IT 240 Introduction to Desktop Databases
IT 130 The Internet and the Web
IT 201 Introduction to Information Systems
IT 215 Analysis and Design Techniques
IM 210 Introduction to Human-Computer Interaction

1 course from the following list:
IS 371 Introduction to I.T. System Management
IS 372 Fundamentals of Software Project Management
IS 373 Introduction to Large Systems Implementation
IS 374 Management Support Systems

**Information Technology Minor**

IT 130 The Internet and the Web
IT 230 Building Internet Applications
IT 240 Introduction to Desktop Databases
TDC 361 Basic Communication Systems
or IT 263 Applied Networks and Security
IT 215 Analysis and Design Techniques
One CTI elective

**Network Technology Minor**

CSC 211 Programming in Java I
or CSC 261 Programming Languages I: C/C++
CSC 212 Programming in Java II
or CSC 262 Programming Languages II: C/C++
IT 201 Introduction to Information Systems
IT 263 Applied Networks and Security
TDC 362 Principles of Data Communications
TDC 363 Introduction to Local Area Networks
TDC 365 Network Interconnection Technologies

**Security Minor**

CSC 211 Programming in Java I
and CSC 212 Programming in Java II
OR
CSC 261 Programming Languages I: C/C++
and CSC 262 Programming Languages II: C/C++
CSC 233 Codes and Ciphers
or CSC 333 Cryptology
IT 378 Host and Information Security
CNS 320 Computer Forensic and Incident Response
CNS 228 Legal, Ethical and Social Issues in Information Security
CNS 340 Fundamentals of Information Assurance

**Software Engineering Minor**

CSC 261 Programming Languages I: C/C++
and CSC 262 Programming Languages II: C/C++
and CSC 224 Java for Programmers
or
CSC 241 Introduction to Computer Science I
and CSC 242 Introduction to Computer Science II
and CSC 224 Java for Programmers
or
CSC 211 Programming in Java I
and CSC 212 Programming in Java II
and then
CSC 383 Data Structures and Algorithms in Java
SE 325 Principles and Practices of Software Engineering
SE 330 Object Oriented Modeling
SE 350 Object-Oriented Software Development

**Visual Computing Minor**

MAT 140 Discrete Mathematics I
or MAT 220 Linear Algebra with Applications
or One quarter of Calculus (CSC 381 requirement)
IT 223 Data Analysis (required for CSC367)
CSC 381 Introduction to Digital Image Processing
CSC 382 Applied Image Analysis
CSC 384 Introduction to Computer Vision
CSC 367 Introduction to Data Mining (IT223 requirement)
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.
Programs in CTI

School of Computer Science, Telecommunications & Information Systems - Undergraduate Studies • Programs in CTI

Current Degree Descriptions

Bachelor of Science Degrees in
- Computer Game Development
- Computer Graphics and Motion Technology
- Computer Science
- Digital Cinema
- E-Commerce Technology
- Information Systems
- Interactive Media
- Network Technology
- Information Technology
- Information Assurance and Security Engineering

Bachelor of Arts Degrees in
- Digital Cinema
- Information Technology

Accelerated BS/MS Degrees

Joint Degree Programs
- BS in Math/Computer Science (with Liberal Arts & Sciences)
- BA in Computing (with the School for New Learning)

Minors