

# Computer and Information Science



Department of Computer and Information Science  
College of Engineering and Computer Science

## The Computer and Information Science Program

Computer and Information Science (CIS) is one of the most rapidly growing professions worldwide. CIS professionals offer expertise in the effective and efficient use of computers for tackling a broad spectrum of practical challenges. The CIS curriculum provides students with a firm foundation in both hardware/architecture and software and in their application.

The field of computer and information science includes the following technical areas: algorithms, artificial intelligence, compilers, computer graphics, computer networks and network administration, database systems and administration, distributed and parallel systems, enterprise computing, formal methods, game design, information systems, operating systems, programming languages, software engineering, and web technologies.

Students complete a minimum of **120** credits and receive a **Bachelor of Science (BS) degree in Computer and Information Science**. Two concentrations are available within the CIS degree: computer science or information systems. The program is primarily directed toward day students, with some evening courses offered. The CIS degree prepares graduates for immediate employment in the computing field and for graduate study.

CIS students interested in scientific or engineering applications, game design, or networking elect the **Computer Science (CS)** concentration. CS concentration students study computer architecture, artificial intelligence, distributed and parallel systems, networks, operating systems, programming, and web technologies. The CS concentration places greater emphasis on understanding how computer systems work and prepares graduates for positions in embedded and systems programming, enterprise computing, graphics and visualization, computer game development, networks, scientific programming, and web technology, among others.

Students interested in applying information technology in commercial, governmental, or scientific contexts elect the **Information Systems (INSY)** concentration. INSY concentration students study computer networks, databases, programming, web technologies, and accounting, and the design and development of information systems. The INSY concentration includes more applications-related courses than the CS concentration and prepares graduates for positions in applications databases, enterprise computing, information systems design, systems analysis, and web-based information systems.

## B.S in CIS Requirements

Area	Semester Credits
<b>Area I: CECS Distribution Requirements</b>	<b>21</b>
COMP 105 English Composition I	3
COMP 270 Technical Writing	3
ECON 201 Macroeconomics	3
– Two courses in the humanities, from specified choices	6
– Two courses in the behavioral/social sciences, from specified choices	6
<b>Area II: Mathematics, Science, Applied Business</b>	<b>26</b>
<b>Mathematics and Statistics</b>	
MATH 115 Calculus I	4
MATH 116 Calculus II	4
CIS 275 Discrete Structures I	4
IMSE 317 Probability and Statistics	3
A two-course laboratory science sequence	8
ENGR 400 Applied Business Techniques	3
<b>Area III: Computer Science and Senior Design</b>	<b>32</b>
<b>Computer Science Core</b>	<b>28</b>
CIS 150 Computer Science I	4
CIS 200 Computer Science II	4
CIS 310 Computer Organization	4
CIS 350 Data Structures & Algorithm Analysis	4
CIS 375 Software Engineering	4
CIS 427 Computer Networks & Distributed Processing	4
CIS 450 Operating Systems	4
<b>Computer Science Senior Design Seminars</b>	
CIS 495 I Senior Design Seminar I	2
CIS 495 II Senior Design Seminar II	2
<b>Concentration Requirements</b>	<b>41</b>
Choose one: Computer Science (CS) or Information Systems (INSY)	

NOTE: Degree and concentration requirements may change. Students should see an advisor for current requirements.

## Computer Science Concentration

### Area I: Distribution Requirements

One upper-level (300-400-level) course in the humanities or the behavioral or social sciences, in the same academic discipline as one of the courses taken above 3

### Area II: Mathematics and Science

MATH 217 Matrix Algebra (or MATH 227 Linear Algebra) 2  
CIS 306 Discrete Structures II 4  
An additional laboratory science course 4

### Area III: Computer Science Concentration Courses

Track courses, approved CIS electives, general electives 28  
Five CS Concentration Tracks are offered:  
Engineering Systems, Game Design, Networking,  
Systems Foundations, and Individualized Computer Science

## Information Systems Concentration

### Area II: Linear Algebra, Cognates

MATH 227 Linear Algebra 3  
Accounting, Organizational Behavior,  
and Operations Research 10

### Area III: Information Systems Concentration Courses

CIS 294 or 296 Visual Basic or Java 3  
CIS 421 Database Systems 4  
CIS 4261 Information Systems Analysis & Design I 4  
CIS 4262 Information Systems Analysis & Design II 4  
CIS electives from approved list 6

General Electives 7

NOTE: Requirements may change. Students should consult an advisor for current requirements.

## Computer Facilities

Modern computer facilities are essential in preparing students for professional positions in the world of computer science and software engineering practice and research. CECS students use a variety of resources such as local area networks of PC and Unix computers and SUN workstations. CIS Department laboratories include the 3-D graphics and visualization laboratory, and the Agile software engineering, database and multimedia systems, games and multimedia environments, game development and usability, geometric modeling, information systems, networking, real-time and secure systems, software engineering research, vehicular networking systems research, virtual engineering, wireless, and the web services laboratories.

## Faculty of the Computer and Information Science (CIS) Department

The CIS degree program is taught primarily by Ph.D. faculty dedicated to teaching and research. The research interests of the CIS faculty include CAD/CAM, computer graphics, digital government, geometric modeling, database systems, data integration, data mining, multimedia information systems, game design, computer usability and accessibility, digital government, distributed systems and middleware, mobile computing, multimedia information systems, organizational information systems, peer-to-peer systems, vehicular networking, security and privacy, real-time systems, semantic web, soft computing, software engineering, web information systems, and web services. Some courses are taught by local industry professionals.

## Cooperative Education

CIS students are eligible to participate in the College of Engineering and Computer Science's Cooperative Education Program. During co-op placements, juniors or seniors alternate semesters of full-time classes with semesters of full-time paid CIS work in a company or organization in their chosen field. Co-op makes it possible for students to gain valuable professional work experience before they graduate, earn a salary, and establish contacts useful for later employment.

Co-op students in computer and information science have found recent co-op placements in such companies as: AM General, Arvin-Meritor, Barton-Marlow Company, Blue Cross/Blue Shield, Cebos, CMJ Designs, Crain Communication, Denso, DTE Energy, EKK Inc., Federal Mogul, Ford Credit, General Electric, Hometown Communications Network, Intel Corporation, Lockheed Martin, Marathon Ashland Petroleum, Masco Corp., Nokia Automotive, Observer, Polk, Ricardo Inc., Sirius Radio, SPX, TKS Industrial, Trans-man Logistics, TRW, Toyota, Unisys, United States Tank Command, Urban Science, U. S. Steel, Valassis, and Vector Cantech.

## Employment Opportunities

A wide variety of employment opportunities is available to computer scientists, such as the following, based on titles of CIS alumni: applications programmer, software engineer, computer systems consultant, telecommunications planner, computer game programmer, computer applications trainer, database administrator, systems analyst or programmer, systems software developer, computer security administrator, computer graphics specialist, network administrator, systems designer, technical writer, computer and technical support analyst, and president of own company. Computer scientists are also employed in research or consulting in education, industry, government, teaching, and training.

Recent graduates from the University of Michigan-Dearborn with a BS in CIS have found professional employment in such companies as Accenture, Activision, Blue Cross/Blue Shield, Chrysler, DTE Energy, EDS, ERIM, Federal Mogul, Ford, General Motors, IBM, Marathon Ashland, NASA, Oracle, and Unisys.

## Admission Requirements

### From High School:

3.00 adjusted GPA or higher and ACT of 22 or higher.

### From Community College or University:

2.75 adjusted GPA (cumulative, mathematics, and science—all three) in transferable courses. Courses with a grade of C- or below do not transfer.

## For More Information

### For Engineering and Computer Science Information:

College of Engineering and Computer Science  
Student Records and Advising  
2000 Heinz Prechter Engineering Complex  
4901 Evergreen Road  
Dearborn, MI 48128-2406  
313-593-5510  
uginfo@engin.umd.umich.edu  
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### For Admissions Information and Applications:

Office of Admissions and Orientation  
University of Michigan-Dearborn  
4901 Evergreen Road  
Dearborn, MI 48128-2406  
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