

Computer Information Science

The Curriculum

The Computer Information Science Department in the School of Mathematics, Computer Science and Engineering conducts a program designed for students who are developing computer programming skills in preparation for professional careers and/or for transfer to a four-year college or university. The department acquaints students with the presently available methods of computer science that are useful in solving problems of science, industry, and government; prepares students for the additional formal education and self-education required in this ever developing field; and fosters students' abilities to solve computer science problems.

The Associate Degree/Occupational Certificate Major

Computer Information Science courses are designed to meet the needs of students at various levels of competence, from the novice to the expert. Students may take individual courses to gain expertise in specific areas, or they may take courses collectively to earn the Associate in Science degree or Occupational Certificate in Computer Information Science with a concentration in any one of three different areas. Students seeking to develop programming skills may pursue either the Computer Languages emphasis, which introduces a variety of programming languages and each language's many applications; the Business Programming emphasis, which concentrates on programming for business applications; or the Systems Analysis emphasis, which explores the structured design and implementation of software systems.

If you intend to transfer

Courses that fulfill major requirements for an associate degree at Irvine Valley College may not be the same as those required for completing the major at a transfer institution offering a baccalaureate degree. If you plan to transfer to a four-year college or university, you should (1) refer to the transfer section of this catalog, (2) consult the catalog of your prospective transfer institution (see the IVC Transfer Center for assistance), and (3) schedule an appointment with an IVC counselor to develop a plan of study before you begin your program. In addition, it may be helpful to meet with the appropriate department faculty at IVC.

If you plan to complete an associate degree or occupational certificate

You must complete the following set of courses to fulfill the requirements for the Occupational Certificate or the Associate in Science (A.S.) degree major. For the A.S. degree, you must also meet the general education requirements listed on page 21. Refer to page 16 for additional options for fulfilling the major requirement for the A.S. degree.

COMPUTER INFORMATION SCIENCE MAJOR

Business Programming Emphasis (A.S. Degree or Occupational Certificate)

		Units
CIS 1	Introduction to Computer Information Systems	3
CIS 101	Introduction to Microcomputer Applications	3
CIS 21	Introduction to Software Engineering	3
CIS 30A	BASIC Programming	3
CIS 30B	Advanced BASIC	3
CIS 32A	Beginning COBOL Programming	3
CIS 32B	Intermediate COBOL Programming	3
CIS 55A	HTML Programming	3
CIS 130	Visual Basic Programming	3
	Total units:	27

Computer Languages Emphasis (A.S. Degree or Occupational Certificate)

		Units
<i>Complete the following core courses:</i>		
CIS 1	Introduction to Computer Information Systems	3
CIS 101	Introduction to Microcomputer Applications	3
<i>Choose any four of the following courses:</i>		
CIS 30A	BASIC Programming	(3)
CIS 32A	Beginning COBOL Programming	(3)
CIS 34	Pascal Programming	(3)
CIS 36	C Programming	(3)
CIS 37	C++ Programming	(3)
CIS 40A	Computer Organization and Assembly Language I	(3)
CIS 55A	HTML Programming	(3)
<i>Choose any three of the following courses:</i>		
CIS 30B	Advanced BASIC Programming	(3)
CIS 32B	Intermediate COBOL Programming	(3)
CIS 41	Data Structures	(3)
CIS 55B	World Wide Web/Internet Using Java Programming	(3)
CIS 130	Visual Basic Programming	(3)
	Total units:	27

The Faculty
 John Beaty
 Mikel Bistany
 Howard Dachslager
 Earl Dugan
 Raul Escobar
 Farimeh Fazeli Tehrani
 Seth Hochwald
 Chan Hong Loke
 Dana Lundy
 Bill Lyon
 Shawn Mesri
 Al Murtz
 Robert Papendick
 Nancy Reynolds
 Terry Smith
 Duc Tran
 David Williams
 Richard Yuhnke

School of Mathematics, Computer Science and Engineering

**Systems Analysis Emphasis
(A.S. Degree or Occupational Certificate)**

Complete the following core courses:		Units
CIS 1	Introduction to Computer Information Systems	3
CIS 21	Introduction to Software Engineering	3
CIS 101	Introduction to Microcomputer Applications	3
Choose any five of the following courses:		
CIS 30A	BASIC Programming	(3)
CIS 32A	Beginning COBOL Programming	(3)
CIS 34	Pascal Programming	(3)
CIS 36	C Programming	(3)
CIS 37	C++ Programming	(3)
CIS 41	Data Structures	(3)
CIS 55B	World Wide Web/Internet Using Java Programming	(3)
CIS 130	Visual Basic Programming	(3)
Total units:		24

PLEASE NOTE:

Beginning Fall 2001, computer courses in the School of Math, Computer Science and Engineering are identified as CIS (Computer Information Science). Computer courses in the School of Business Sciences are identified as CIM (Computer Information Management).

Computer Science Courses

Computer Information Science 1 3 units
INTRODUCTION TO COMPUTER SYSTEMS

Coreq: CIS 50L. This course provides an overview of computer information systems and introduces computer hardware, software and applications, as well as career opportunities in the industry. Students will write and execute elementary programs in the BASIC programming language. Students are also provided hands-on experience using DOS and spreadsheet, database, word processing, and graphics applications software. This course is designed to meet the requirements of the Data Processing Management Association (DPMA) Model Curriculum. NR
Lecture hours: 3

Computer Information Science 6A 3 units
COMPUTER MATHEMATICS I

Prereq: Math 2. Recom: Concurrent enrollment in Math 180. This course is designed primarily for computer science majors. Areas of study include Boolean Algebra, propositional calculus, and predicate calculus. Topics include truth tables, minimization, sets, relations, switching networks, digital circuits, and duality. This course is also listed as Math 30; credit will be given in either area, not both. NR
Lecture hours: 3

Computer Information Science 30A 3 units
BASIC PROGRAMMING

Coreq: CIS 50L. Recom: CIS 1. This is a beginning course in computer programming which introduces fundamental programming concepts and skills using the BASIC programming language. Students will exercise problem-solving skills in a wide range of applications as they analyze problems, develop algorithms, design programs, and resolve program errors. NR
Lecture hours: 3

Computer Information Science 6B 3 units
COMPUTER MATHEMATICS II

Prereq: Math 2. Recom: Concurrent enrollment in Math 180. This course is designed primarily for computer science majors. Areas of study include permutations, combinations, binomial coefficients, recurrence relations, graph theory, generating functions, and probability theory. This course is also listed as Math 31; credit will be given in either area, not both. NR
Lecture hours: 3

Computer Information Science 30B 3 units
ADVANCED BASIC PROGRAMMING

Prereq: CIS 30A. Coreq: CIS 50L. This course extends the BASIC language syntax learned in Computer Information Science 30A, with emphasis on the design structure and style of BASIC programs in business and science. The course covers algorithms; structured programming; advanced array manipulation, including sorting and searching; and sequential and random access file processing techniques. NR
Lecture hours: 3

Computer Information Science 21 3 units
INTRODUCTION TO SOFTWARE ENGINEERING

Prereq: Two previous computer programming courses. Coreq: CIS 50L. This course covers the specification, design, implementation, testing and documentation of a software system. The methods used to create the software system will include effective oral and written communication of concepts, proper programming style, well-planned testing, and group cooperation. NR
Lecture hours: 3

Computer Information Science 32A **3 units**
BEGINNING COBOL PROGRAMMING
Prereq: CIS 1. Coreq: CIS 50L. Recom: CIM 100A. This course provides an introduction to COBOL programming in a business environment. Emphasis is placed on implementation and documentation of common business-oriented applications. The syntax of the COBOL language is taught with emphasis on the four divisions of COBOL, COBOL verbs, clauses, and phrases. This course is designed to meet the requirements of the Data Processing Management Association (DPMA) Model Curriculum. NR
Lecture hours: 3

Computer Information Science 32B **3 units**
INTERMEDIATE COBOL PROGRAMMING
Prereq: CIS 32A. Coreq: CIS 50L. This course is a continuation of Computer Information Science 32A. The course focuses on structured procedures for designing programs. Students will develop, test, implement, and document programs for common business applications using the COBOL programming language. The course will cover sequential and random access files and processing techniques, as well as techniques for developing programs and systems of programs for batch and interactive environments. This course is designed to meet the requirements of the Data Processing Management Association (DPMA) Model Curriculum. NR
Lecture hours: 3

Computer Information Science 33 **3 units**
FORTRAN PROGRAMMING
Prereq: Math 253. Coreq: CIS 50L. This course concentrates on the writing of computer programs in the FORTRAN programming language. Students will use FORTRAN to solve a wide variety of science- and business-related problems. NR
Lecture hours: 3

Computer Information Science 34 **3 units**
PASCAL PROGRAMMING
Coreq: CIS 50L. Recom: CIS 30A. This course covers computer programming, including design procedures, and applies Pascal, a procedure-oriented language, to solutions of a wide variety of problems relating to business and science. Emphasis is placed on the development, debugging, and testing of procedure-oriented programs that use scalar, structured, and dynamic data types including arrays, files, records, and pointers. Both recursive and non-recursive procedures and functions will be used in the solution of problems. The course includes an introduction to software engineering and object-oriented programming. Students implement abstract data types and units. NR
Lecture hours: 3

Computer Information Science 35 **3 units**
ADA PROGRAMMING
Prereq: CIS 34, 36, or 37. Coreq: CIS 50L. This course is an introduction to the Ada programming language. Topics will include lexical style, control structures, data types, exceptions, packages, and tasking. NR
Lecture hours: 3

Computer Information Science 36 **3 units**
C PROGRAMMING
Prereq: CIS 34, 35, or 40A. Coreq: CIS 50L. This course introduces the C programming language. Topics include lexical conventions, data types, control structures, functions, pointers, records, structures, input/output, and operating system interfaces. NR
Lecture hours: 3

Computer Information Science 37 **3 units**
C++ PROGRAMMING
Prereq: CIS 36. Coreq: CIS 50L. This course introduces the C++ programming language. Topics include lexical conventions, data types, functions, control structures, overloading, classes, and object-oriented programming. NR
Lecture hours: 3

Computer Information Science 40A **3 units**
COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE I
Prereq: Any two programming language courses. Coreq: CIS 50L. Recom: Math 253. This course introduces computer organization, focusing especially on machine language and assembly language programming. Topics include finite precision arithmetic, floating point architecture, and Boolean algebra. The course also discusses the organization of computer systems, conventional machine language, and corresponding assembly language notation. NR
Lecture hours: 3

Computer Information Science 40B **3 units**
COMPUTER ORGANIZATION AND ASSEMBLY LANGUAGE II
Prereq: CIS 40A. Coreq: CIS 50L. This course is a continuation of Computer Information Science 40A. Students will further study computer organization and assembly language and the differences among assembly languages from one family of computers to another. The course will also examine microprogramming, operating systems, and multilevel machines. NR
Lecture hours: 3

Computer Information Science 41 **3 units**
DATA STRUCTURES
Prereq: One year of programming and Math 253. Coreq: CIS 50L. This course examines the basic concepts of data structures and related algorithms. Students will use stacks, queues, trees, graphs, and strings to design algorithms and then write complete programs using a programming language such as Pascal, C, or C++ to implement these algorithms. Recursion, searching, sorting, and a timing and space analysis for algorithms will also be discussed. NR
Lecture hours: 3

Computer Information Science 55A **3 units**
HTML PROGRAMMING
Prereq: CIS 101. Coreq: CIS 50L. This course focuses on developing World Wide Web pages for the Internet using hypertext markup language (HTML). Topics include HTML syntax and operating procedures and Common Gateway Interface (CGI) scripts, as well as basic HTML elements such as lists and tables. NR
Lecture hours: 3

Computer Information Science 55B **3 units**
WORLD WIDE WEB/INTERNET USING JAVA PROGRAMMING
Prereq: CIS 36 or 37. Coreq: CIS 50L. This course focuses on application development using JAVA. JAVA syntax and operating procedures will be covered along with design and programming techniques for object-oriented programs in JAVA. Additional topics include Applet Programming in JAVA, exception handling, graphics, fonts, colors, multireading, streams, and native methods and libraries. NR
Lecture hours: 3

Computer Information Science 101 **3 units**
INTRODUCTION TO MICROCOMPUTER APPLICATIONS
Coreq: CIS 100L. This course introduces students to the uses, characteristics, capabilities, and operation of microcomputer application software. The course covers basic concepts and vocabulary common to application packages. Concurrent lab work using generic software will familiarize the student with word processing, spreadsheet, database management, graphics, communication, and financial packages. This course will prepare the student for more detailed courses in application software. NR
Lecture hours: 3

Computer Information Science 130 **3 units****VISUAL BASIC PROGRAMMING**

Prereq: CIS 30A. *Coreq:* CIS 100L. This course focuses on the development of applications using Visual Basic. The course covers Visual Basic syntax and operating procedures, as well as design and programming techniques for event-driven and object-oriented programs in Visual Basic. Additional topics include error handling, graphics, adding colors, adding icons, accessing databases, linking applications using Dynamic Data Exchange (DDE), and Object Linking and Embedding (OLE). NR

Lecture hours: 3

Computer Information Science 131 **3 units****DATABASE MANAGEMENT PROGRAMMING**

Prereq: CIM 214.1A. *Coreq:* CIS 100L. This is a basic course in computer programming using a database management programming language such as dBASE III or RBase. Students will work with computers to develop and use database programs and functions. Students will also design, code, and execute practical business programs on computers. Emphasis will be on database management in both the immediate and deferred mode. NR

Lecture hours: 3

Computer Information Science 142 **3 units****UNIX OPERATING SYSTEM**

Coreq: CIS 100L. *Recom:* CIS 103A. This course covers the UNIX operating system, its uses and capabilities. Students will perform a variety of computer operations using the UNIX system. NR

Lecture hours: 3

Computer Information Science 143 **3 units****RPG PROGRAMMING**

Coreq: CIS 100L. *Recom:* CIS 1. This course provides an introduction to RPG programming. The course focuses on the writing of computer programs in the RPG language to generate business reports. Students will produce reports by manipulating data files. NR

Lecture hours: 3

COMPUTER SEMINAR**Computer Information Science 99** **0.5-5 units****SEMINAR IN COMPUTER INFORMATION SCIENCE**

Computer Information Science 99 is a lower-division seminar given over to the study of a specific topic, issue, or problem within computer information science which is not part of the regular college curriculum. Granting of UC credit for courses of this kind is contingent upon a review of the course outline by a UC campus. R-E

Lecture hours: 0.5-5 *Lab hours:* 0.5-5

SPECIAL TOPICS**Computer Information Science 189** **0.5-4 units****SPECIAL TOPICS IN COMPUTER INFORMATION SCIENCE**

The Special Topics course is a grouping of short seminars designed to provide students with the latest ideas in the field of computer and information science. The content of Special Topics in computer and information science is thematic in nature, and each seminar within the course differs from other offerings in the same course. R-E

Lecture hours: 0.5-4

Computer Information Science 289 **0.5-5 units****SPECIAL TOPICS IN COMPUTER INFORMATION SCIENCE**

The Special Topics course is a grouping of short seminars designed to provide students with the latest concepts in the field of computer information science. The course content is thematic in nature, and each seminar topic within the course differs from other offerings in the same course. R-E

Lecture hours: 0.5-5 *Lab hours:* 0.5-5

SPECIAL SERVICES**Computer Information Science 320** **1.5 units****ADAPTIVE COMPUTER ASSESSMENT**

This course is designed to provide physically limited students an overview of adaptive computer devices and to assess each student's individual needs. Appropriate modifications will be made to accommodate disabled students in computer courses. R-E-1

Lecture hours: 1.5

COMPUTER LABS**Computer Information Science 50L** **1 unit****COMPUTER INFORMATION SCIENCE LABORATORY**

Coreq: Any computer science course numbered 1-99. This course is the laboratory component for computer science courses. This course will be graded on a credit/no credit basis. R-E-99.

Lab hours: 3

Computer Information Science 100L **1 unit****COMPUTER INFORMATION SCIENCE LABORATORY**

Coreq: Any computer science course numbered 100-199. This course is the laboratory component for computer science courses. This course will be graded on a credit/no credit basis. R-E-99.

Lab hours: 3

Computer Information Science 181L **1 unit****COMPUTER CHEMISTRY LABORATORY**

Coreq: Chem. 1A, 1B, 3, 4, 12A, 12B, or 100. This course is designed to provide students opportunities to use appropriate computer software in order to clarify chemical concepts, to use these concepts to solve problems, and to perform simulated lab activities. Such hands-on experiences will strengthen student understanding of chemical concepts, build self-confidence, and increase the chances of success in the chemistry program. R-E-3

Lab hours: 3

Computer Information Science 205L **1 unit****COMPUTER-AIDED DRAFTING ACCESS LABORATORY**

Coreq: Dr. 100, 101, 102, 150, 160, 161, 162 or 180; or Engr. 23, 183, or 184; or Engt. 130. This course allows students taking drafting CAD courses access to applications software to support their coursework. R-E-99

Lab hours: 3