
COMPUTER EDUCATION

At the elementary school level, computer instruction occurs primarily as a tool to enhance learning in various content areas. For example, many schools use computers for researching on-line databases as well as for production, presentation, and publication of student learning. In addition, standards-based software may be used to assist students in attaining academic skills.

At the secondary school level, mobile computing, technology tools, on-line resources, and content-specific software are utilized to assist students in becoming technologically literate as well as meeting state content standards. In addition, however, the Educational Technology Department has developed a number of courses that focus on computers themselves; their hardware, software, and tools, their uses in and outside of the classroom. This section describes those courses.

COMPUTER LITERACY GRADUATION REQUIREMENT

The district's Administrative Procedure 4770 requires all students to demonstrate technology proficiency (in grades 5–12) through completion of an approved course that incorporates computer education and applications. In very special circumstances a student at the high school level may also meet this requirement by passing the district's computer literacy test. However, students should take one of the approved courses, which include an extensive standards-based curriculum that meets the district's core competencies. These core competencies define the skills in which students must demonstrate proficiency in order to meet the graduation requirement; that is, students who graduate from the San Diego Unified School District will be able to:

1. Apply strategies for identifying and solving routine hardware and software problems that occur during everyday use.
2. Demonstrate knowledge of current changes in information technologies and the effect those changes have on the workplace and society.
3. Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse.
4. Apply productivity and multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum.
5. Design, develop, publish, and present products (e.g., Web pages, videotapes) using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.
6. Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.
7. Select and use appropriate tools and technology resources to accomplish a variety of tasks and solve problems.
8. Demonstrate an understanding of concepts underlying hardware, software, and connectivity, and of practical applications to learning and problem solving.
9. Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

The district's computer literacy standards are adapted from the National Educational Technology Standards and may be found at:

www.edtech.sandi.net/hstech

The computer education courses described in this section all provide students the opportunity to meet this graduation requirement. In addition, there is a small number of courses from other subject areas that also meet the district's computer literacy requirement. These are shown in the table at the top of the following page. Additional information is available at:

www.edtech.sandi.net

Courses Offered by Other Departments that Meet the District’s Computer Literacy Graduation Requirement

Course Title	Course Number(s)	Department	Type of Graduation Credit Earned
Computer Applications in Science 1,2 (site-adopted)*	0552, 0553	Career Technical Education	Practical Arts
Computer Applications in Business 1,2	0723, 0724	Career Technical Education	Practical Arts
Keyboarding and Computer Literacy 1	0722	Career Technical Education	Practical Arts
Virtual Enterprise 1,2	0581, 0582	Career Technical Education	Elective
Science 7th—Computers and Technology 1,2	6008, 6009	Science	N/A
Science and Technology 7th IB (site-adopted)*	6087	Science	N/A
Science and Technology 8th IB (site-adopted)*	6088	Science	N/A
Business and Computer Applications 1,2; 3,4	8651, 8652, 8653, 8654	Regional Occupation Program	Practical Arts
Geographic Information Systems and Global Technologies 1,2; 3,4; (1-2, (3-4), CC 5,6	8291, 8292, 8293, 8294, 8295, 8296, 8297, 8298	Regional Occupation Program	Practical Arts
Information Technology and Networking 1,2; 3,4; (1-2), (3-4), CC 5,6	8474, 8475, 8476, 8477, 8478, 8479, 8487, 8488	Regional Occupation Program	Practical Arts
Technology Support Services 1,2	8923, 8924	Regional Occupation Program	Practical Arts
Web Site Design 1,2; 3,4; (1-2), (3-4), CC 5,6	8931, 8932, 8933, 8934, 8935, 8936, 8937, 8938	Regional Occupation Program	Practical Arts

* Site-adopted courses are described in *District Pilot and Site-Adopted Courses: A Supplement to the Course of Study, K–12*, PeopleSoft item number 3470.

Computer Education Courses (Grades 5–12)

Sequence of Districtwide* Courses

Grade Level			
5 [†]	6	7	8
Exploring Computers 5th-8th (4403)			
9	10	11	12
Computer Applications 1,2 (4421, 4422)			
Computer Science 1,2 (4411, 4412)[§]			
		Computer Science 3,4 (4413, 4414)	
		Computer Science A 1,2 AP (4461, 4462)	
		Computer Science AB 1,2 AP (4498, 4499)	

* Pilot courses and courses approved by the Board of Education to be offered at specific sites only are described in *District Pilot and Site-Adopted Courses: A Supplement to the Course of Study, K–12*, PeopleSoft item number 3470.

[†] For middle school students in grade 5.

[§] **Boldface** denotes courses that are currently accepted by the University of California as meeting its **g** (college preparatory electives) entrance requirement. However, each district high school seeking recognition by the university of these courses for its students must include the courses on its individual UC-approved list.

The following course descriptions are arranged **alphabetically**. Refer to the chart on page CE-2 for guidance.

COMPUTER APPLICATIONS 1,2 (4421, 4422)

Grade level: 9–12

Prerequisites: None

Course duration: Two semesters

Subject area in which graduation credit is given:

Elective

Note: Students who complete this course successfully will meet the district’s computer literacy graduation requirement.

Note: An identical course for special education students (7793, 7794) also is offered, which provides access to the core curriculum while allowing for accommodations in the pacing of course content.

COURSE DESCRIPTION

This course provides instruction in understanding the following:

- word processing
- graphics
- page layout
- spreadsheets
- databases
- telecommunications
- Internet research
- multimedia and presentation software
- computer history, trends, and careers
- buying computers
- reading and understanding computer ads and periodicals
- computer networks
- Web design, development, and publishing
- audio file formats
- GIF animations
- keyboarding
- computer hardware (scanners, optical character readers, projection, etc.)

BASIC TEXTS AND TEACHING GUIDES

Discovering Computers 2003: Concepts for a Digital World, Thompson Learning, 2003.

Learning Microsoft Office 2000, DDC, 2000.

Software: *Microsoft Office 2001*, Microsoft, 2001.

Software: *Photoshop*, Adobe, 2002.

Software: *Dreamweaver*, Macromedia, 2002.

Software: *Office XP Pro Front Page*, Microsoft, 2002.

COMPUTER SCIENCE 1,2 (4411, 4412)

Grade level: 9–12

Prerequisites: Successful completion of Pre-Algebra recommended.

Course duration: Two semesters

Options for Instructional Settings: This course may also be taught in the following settings:

- Cluster: 4411C, 4412C

Subject area in which graduation credit is given:

Elective

Note: Students who complete this course successfully will meet the district’s computer literacy graduation requirement.

Note: An identical course for special education students (7791, 7792) also is offered, which provides access to the core curriculum while allowing for accommodations in the pacing of course content.

COURSE DESCRIPTION

College Preparatory Course (P). In Computer Science 1,2 students will increase their problem-solving skills and be able to differentiate between problems that computers can and cannot solve. Students will use a high-level programming language, which will expose them to the structured approach and object-oriented programming technique. In addition, this course will introduce students to the basic components of a computer, plus an individual computer’s role in the functions of a computer system. Computer Science 1,2 will provide a basic understanding of how a computer works as well as how and where computers are used in today’s society. Related careers will be explored. This course may be taught in the regular education setting as well as in a cluster setting.

BASIC TEXTS AND TEACHING GUIDES

Lambert and Osborne, *Fundamentals of Java, Comprehensive Course*, 2nd. ed., Thompson Course Technology, 2003.

COMPUTER SCIENCE 3,4 (4413, 4414)

Grade level: 10–12

Prerequisites: Computer Science 1,2 or consent of the instructor

Course duration: Two semesters

Subject area in which graduation credit is given:

Elective

Note: Students who complete this course successfully will meet the district’s computer literacy graduation requirement.

COURSE DESCRIPTION

College Preparatory Course (P). In Computer Science 3,4 students will write computer programs using data files and high-resolution graphics that require the construction and use of shape tables. They will also design programs that use animation in graphics as well as use machine language routines in a high-level computer language program. An emphasis will be placed on learning and developing programming techniques needed to solve more complicated problems on the computer. Students are taught to structure their programs as a set of modules, with each module performing a particular function. This course provides students with the necessary background for taking Advanced Placement Computer Science.

BASIC TEXTS AND TEACHING GUIDES

Horstmann, *Computing Concepts with Java Essentials*, 3rd. ed., Wiley, 2003.

COMPUTER SCIENCE A 1-2 ADVANCED PLACEMENT (4461, 4462)

Grade level: 9–12

Prerequisites: Grade of A or B in Computer Science 1,2; grade of A or B in Algebra 1-2 and Geometry 1-2, or grade of A or B in Algebra 1-2 Advanced and Geometry 1-2 Advanced; recommendation of AP computer science instructor.

Course duration: Year course

Subject area in which graduation credit is given: Elective, weighted (see note below)

Note: Students who complete this course successfully will meet the district’s computer literacy graduation requirement.

COURSE DESCRIPTION

Honors Preparatory Course (HP). This course covers the writing of structured code in a procedural language using data types and algorithms. Designing and implementing computer-based solutions as well as learning well known algorithms and data structures will be included. Another component of the class will incorporate reading and understanding of a large program in addition to understanding the description of the design and

development process of such a program. Students will be able to identify the major hardware and software components of a computer system, their relationship to one another, and the roles of these components within the system. In addition, students will develop and select appropriate algorithms and data structures to solve problems as well as to code fluently in a well-structured fashion. Recognizing the ethical and social implications of computer use will be stressed.

Note: Students who complete this course successfully but do not sit for the corresponding AP examination will receive *unweighted* credit. See Administrative Procedure 4770, section C.3.

BASIC TEXTS AND TEACHING GUIDES

Horstmann, *Computing Concepts with Java Essentials*, 3rd. ed., Wiley, 2003.

COMPUTER SCIENCE AB 1-2 ADVANCED PLACEMENT (4498, 4499)

Grade level: 11–12

Prerequisites: Grade of A or B in Computer Science 1,2; grade of A or B in Algebra 1-2 and Geometry 1-2, or grade of A or B in Algebra 1-2 Advanced and Geometry 1-2 Advanced; recommendation of AP computer science instructor.

Course duration: Year course

Options for Instructional Settings: This course may also be taught in the following settings:

- Seminar: 4498S, 4499S

Subject area in which graduation credit is given: Elective, weighted (see note below)

Note: Students who complete this course successfully will meet the district’s computer literacy graduation requirement.

COURSE DESCRIPTION

Honors Preparatory Course (HP). In this course, students will design and implement computer-based solutions to problems as well as explain and use several commonly used algorithms and types of data structures. Students will be able to select the most appropriate algorithms and data structures to solve these problems. This course will provide well-structured methods in the coding of programs in Java or other computer languages.

Note: Students who complete this course successfully but do not sit for the corresponding AP examination

will receive *unweighted* credit. See Administrative Procedure 4770, section C.3.

BASIC TEXTS AND TEACHING GUIDES

Weiss, *Data Structures and Problem Solving Using Java*, 2nd. ed., Prentice Hall/Addison Wesley, 2002.

EXPLORING COMPUTERS 5TH–8TH (4403)

Grade level: 5–8

Prerequisites: None

Course duration: One semester. Also, six-, nine-, or 12-week portion of an 18-week (one-semester) wheel; multiple credit allowed

Options for Instructional Settings: This course may also be taught in the following settings:

- Collaborative: 4403G
- Sheltered: 4403L

Subject area in which graduation credit is given:

Does not apply

Note: Students who complete the one-semester or 12-week versions of this course successfully will meet the district's computer literacy graduation requirement. The six- and nine-week versions *no longer* meet this requirement.

Note: An identical course for special education students (7790) also is offered, which provides access to the core curriculum while allowing for accommodations in the pacing of course content.

COURSE DESCRIPTION

Exploring Computers 5th–8th covers the basics of computers, including ethics, vocabulary, hardware, and software. Word processing, databases, spreadsheets, draw and paint tools, and multimedia will be emphasized. Telecommunications (i.e., Internet and electronic mail) will be another component of the class. A hands-on, project-based approach will be utilized. This course may be taught in the regular education setting as well as in a sheltered setting.

BASIC TEXTS AND TEACHING GUIDES

Zimmerly and Jaehne, *Computer Connections*, Glencoe, 2004.

Exploring Computers 7–8, San Diego Unified School District, 1998–1999 (formerly a stock item; now available on the district's computer network from the Educational Technology Unit).