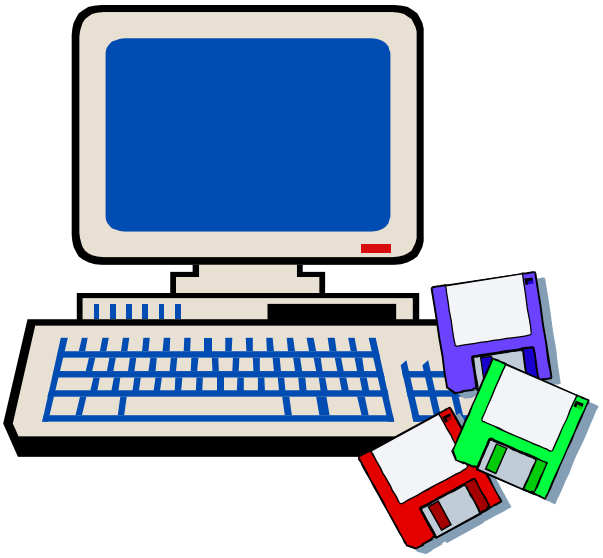
COMPUTER EDUCATION

COURSE TITLES AND DESCRIPTIONS



Louisiana Department of Education

Cecil J. Picard, Superintendent

Approved by BESE
October 1999

reaching for results

State Board of Elementary and Secondary Education

This public document was published at a cost of ___ per copy by the State Department of Education to provide assistance with Secondary Technology Courses to teachers and administrators in LEAs, under authority of R. S. 17:22. This material was printed in accordance with the standards for printing by state agencies established pursuant to R.S. 43:31.

For additional information about the **Computer Education Courses**, contact
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Introduction

The role of computers and technology in our society has changed dramatically over the past decade. In all likelihood the pace of technological change will intensify in the new millennium. In order to prepare Louisiana students to meet the challenges and opportunities of an information- and technology-rich world, additional secondary technology courses have been added to the Computer Education Course of Study.

Each of the new computer education courses is design to help students:

- Effectively utilize appropriate technologies for the completion of multi-step tasks;
- Communicate and interact successfully with others in various environments;
- Demonstrate the interpersonal, teamwork, and leadership skills necessary to function in diverse settings;
- Manage data from a variety of areas to make wise decisions;
- Utilize analytical tools in order to understand and implement appropriate problem solving strategies;
- Develop Career awareness and related skills.

The expanded secondary computer education course of study fosters the responsible use of technology and information to solve problems, to create quality products, and to "…prepare all students to be lifelong learners and productive citizens of the 21st century."

Computer Education Course Criteria

Computers and related digital technologies* are integrated in studies across a variety of curriculum areas. However, courses in the Computer Education program of study and courses that qualify as computer-related electives for the TOPS program are distinguished by content and instructional methods that have technology as the primary focus.

Specifically, all courses in the Computer Education program of study and all TOPS computer related electives must meet the following criteria:

1. The primary focus and content of the course is the investigation and use of multiple digital technologies*.
2. The primary strategies and activities of the course involve hands-on use of digital technologies*.
3. The primary outcome of the course is the application of digital technologies* in problem solving of real world situations.

*Digital technologies include, but is not limited to,the following type of devices: computers, digital cameras, scanners, and video conferencing equipment.

The Louisiana Content Standards Initiative recognizes technology as a valuable tool in the education process. Establishing guidelines for educational technology and for secondary computer/technology courses will enhance the effective integration of technology in standards-based curricula.

Computer Education
Course Titles

Computer/Technology Applications (1 credit)

Computer Architecture (1 credit)

Computer/Technology Literacy (1/2 credit)

Computer Science I (1 credit)

Computer Science II (1 credit)

Computer Systems and Networking I (1 credit)

Computer Systems and Networking II (1 credit)

Desktop Publishing (1/2 credit)

Digital Graphics & Animation (1/2 credit)

Multimedia Productions (1 credit)

Web Mastering (1/2 credit)

Independent Study in Technology Applications (1 credit)

Computer Education
Course Descriptions

Computer/Technology Applications (1 credit)
Description:
Computer Applications is an in-depth study of application programs that provide students with tools to assist in cross-curricular problem-solving projects (Such as A+ Certification). Students will select and integrate appropriate productivity tools including, but not limited to, word processor, database, spreadsheet, desktop publishing, presentation graphics, telecommunications, and draw and paint programs. Students will deliver the product electronically in a variety of media, such as, printed copy, monitor display, Internet documents, and video.

Note: A student cannot earn credit in both Computer Applications and Business Computer Applications.

Computer Architecture (1 credit)
Description:
The focus of the Computer Architecture Course is to prepare students as entry-level service technicians with an industry standard certification. This certification will enable students to link electronics and Information Technology Departments. Core technologies in hardware maintenance and operating systems are at the center of all activities. Topics to be covered include, but are not limited to, the following areas: Operating *systems*: installation, upgrading, maintenance, and configuration; *Hardware*: installation, upgrading, maintenance, and configuration; and, *System Architecture*: bus speed configuration, installing components, and external ports.

It is the responsibility of a district that offers Computer Architecture to address the unique issues associated with this highly technical course. In particular, district personnel assume responsibility for (1) the identification and selection of appropriate curriculum (whether locally developed or vendor-specific), (2) securing necessary teacher-training and technical certification for the instructor, and (3) completing contractual and legal arrangements with vendors, if a vendor-specific curriculum is used.

Note: A student cannot earn credit in both Computer Architecture and Computer Electronics offered by Technology Education.

Computer/Technology Literacy (1/2 credit)
Description:
Computer/Technology Literacy is a one-semester entry-level survey course introducing students to (1) technology career options, (2) personal/professional productivity software applications, (3) multimedia productions, (4) Internet exploration and web page design, and (5) programming. Ethical considerations in technology usage, e.g., privacy, copyright, and filtering, will be discussed.

Through the study and hands-on use of technology applications, students will learn to make informed decisions about technologies and their applications. By using technology as a tool that supports the work of individuals and groups in solving problems, students will select the appropriate technology source for the task, synthesize knowledge, create a solution, and

evaluate the results. The acquisition of information includes using search strategies and technology to access, analyze and evaluate acquired information. Students communicate information in different formats and to diverse audiences. A variety of technologies will be used.

Computer Science I (1 credit)
Computer Science I is a full-year elective course designed for students interested in studying the structure and power of programming languages. Emphasis will be placed on development of algorithms and logical solution structure including the use of visual organizers in the design process. A prevailing computer language will be used to code problem solutions. A brief overview of the development, design and functionality of a computer will be included.

It is recommended that students have proficiency in knowledge and skills of Algebra I or its equivalent.

Computer Science II (1 credit)
Course Description:
In Computer Science II, students will develop coding proficiency in a contemporary programming language, creating robust programs with increased emphasis on design, style, and clarity of expression and documentation for ease of maintenance, program expansion, reliability, and validity. The advantages and disadvantages of object-oriented data will be delineated. Topics should include, but not be limited to, recursion, advanced data structures, and a variety of search and sort techniques. Due to the required higher order thinking skills and logic structure, it is recommended that the same programming language be used for Computer Science I and II.

Prerequisite:
The prerequisite for this course is proficiency in the knowledge and skills of Computer Science I. Successful completion or concurrent enrollment in Algebra II is strongly recommended.

Computer Systems and Networking I (1 credit)
Description:
Computer Systems and Networking I is a one-year course designed to begin a student's study of networking and computer systems. In Computer Systems and Networking I students explore and have practical experience the following topics: network operating systems; OSI model and industry standards; network topologies; IP addressing, including subnet masks; network components; basic network design; beginning router configurations; and, routed and routing protocols. It is recommended that a student, who successfully completes Computer Systems and Networking I, continue and complete the study of systems and networking issues in the Computer Systems and Networking II course.

Prerequisite:
The prerequisite for this course is proficiency in the knowledge and skills of computer operating systems, hardware, and system architecture.

Note: It is the responsibility of a district that offers Computer Systems and Networking I and/or II to address the unique issues associated with this highly technical course. In particular, district personnel assume responsibility for (1) the identification and selection of appropriate curriculum (whether locally developed or vendor-specific), (2) securing necessary teacher-training and technical certification for the instructor, and (3) completing contractual and legal arrangements with vendors, if a vendor-specific curriculum is used.

Computer Systems and Networking II (1 credit)
Description:
Computer Systems and Networking II is a one year course designed to extend the study of networking and computer systems that was initiated in Computer Systems and Networking I. Successful completion of Computer Systems and Networking II will support a student's preparation to obtain industry-standard system and networking certification. Topics studied include, but are not limited to, the following areas: advanced router configurations; LAN switching theory and VLANs; advanced LAN and LAN switched design; WAN theory and design; WAN technology; network troubleshooting; national SCANS skills; and, threaded case studies.

It is the responsibility of a district that offers Computer Systems and Networking I and/or II to address the unique issues associated with this highly technical course. In particular, district personnel assume responsibility for (1) the identification and selection of appropriate curriculum (whether locally developed or vendor-specific), (2) securing necessary teacher-training and technical certification for the instructor, and (3) completing contractual and legal arrangements with vendors, if a vendor-specific curriculum is used.

Prerequisite:
The prerequisite for Computer Systems and Networking II is Computer Systems and Networking I.

Desktop Publishing (1/2 credit)
Description:
Concepts of layout and design will be studied and explored. Students will use logical steps when integrating text and graphics (original and scanned) to create papers, reports, newsletters, brochures, and other professional-looking documents. Effective communication techniques will be used when producing these documents. Students will identify, compare, and use various desktop publishing technologies and determine appropriateness to the task or audience. Terms related to topography and principles of page design will be studied. Software will be evaluated for appropriateness.

The learning environment will extend beyond the classroom through creation and sharing of electronically formatted and published document via electronic networks. A variety of strategies will be used to create effective designs. Students will develop portfolios of work produced for assessment purposes. Keyboarding skills are a recommended prerequisite for the Desktop Publishing course.

Digital Graphics and Animation (1/2 credit)
Description:
In the Digital Graphics course, students will use graphics, images, and/or video to create content-oriented productions. The media used within these productions will be developed, edited, or otherwise manipulated by the students. Final products should reflect multimedia elements, knowledge of design theory, effective use of productivity tools, and the conveyance of content-rich information.

Multimedia Productions (1 credit)
Description:
Multimedia Productions is a course that combines text, graphics, sound, animation, and video delivered by computer or other electronic means. The course focuses on the systematic design and development of effective, efficient, and appealing visual productions. Students plan and design production sequences, then use computer-based authoring/multimedia software to deliver the production. Current and emerging technologies, such as laserdiscs, CD technology, digitized audio, digitized still and motion video, and scanned images, are incorporated into multimedia projects. Finally, students design, develop, implement, and evaluate productions. Class sessions consist of discussions, collaborative activities, demonstrations, skills-building activities, peer evaluation, and time to work on projects.

Fundamental computer skills (use of input/output devices; basics of operating systems, including saving/transferring files, opening programs, using a file manager; basics of software applications; and basic Internet skills, including email, navigation and search capabilities, and downloading capabilities) are a recommended prerequisite for the Multimedia Productions course.

The sophisticated technical requirements of the Multimedia Productions course require that a district include evaluation of the materials and equipment available for an instructional hands-on approach rather than a lecture-based approach prior to implementation of such a course.

Note: A student cannot receive credit in both Multimedia Productions and Computer Multimedia Presentations.

Web Mastering (1/2 credit)
Description:
Concepts of web communication will be studied and explored. Students will design, develop, and maintain web pages using appropriate current editors and/or tagging languages. Students will demonstrate technical knowledge of the equipment and an ability to use a variety of input devices, file formats and transfer methods. Students will gain proficiency in the use of the various browsers used to navigate the web and will study connectivity issues as needed. Security and privacy issues, copyright infringement, trademarks and other legal issues relating to use of the web will be studied. Students will use appropriate search methods and applications to retrieve and evaluate information and use a variety of web communications. Career possibilities related to the internet and web design will be explored.

Independent Study in Technology Applications (1 Credit)
Description:
Independent Study in Technology Applications is an advanced level course designed to build upon concepts of technology applications introduced and developed in previous secondary technology courses. In addition to addressing basic concepts in greater depth, more advanced applications of technology are addressed in real-life contexts. Students will apply technology tools in the context of authentic situations, which may deal with specific technologies as well as situations and issues in other disciplines.

Students enrolled in *Independent Study in Technology Applications* are required to (1) pose hypotheses/questions related to a selected problem; (2) work with a mentor to determine problem to be solved and strategies to be implemented; (3) develop and apply advanced technology application skills in the solution of the problem; (4) analyze information for validity

and relevance in the confirmation, testing, and solution of the hypotheses and questions; (5) produce documentation to illustrate the progress of the project including, but not limited to, journals, logs, videos, pictorial documentation, computer programs, multimedia products, and printed books; and (6) produce original work to solve the identified problem and publish the product in electronic media and print.

Prerequisite:
The prerequisite for this course is the completion of a high school technology course as identified in the Bulletin 741 Course of Study for Computer Education and permission of the instructor/mentor for *Independent Study in Technology Applications*. This course may be taken at Grades 10-12.

Note:
Independent Study in Technology Applications is a performance and production class with new problems and technology tasks each year. A student may repeat *Independent Study in Technology Applications* a maximum of two times.

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