

INFORMATION TECHNOLOGY

INDUSTRY SECTOR STANDARDS

Industry Sectors are an integral part of education reform initiatives and the systems approach to learning by linking academics to the real world of work. Industry sectors are designed to better align career path coursework with the current and projected employment opportunities in specific career fields. Industry sectors create the linkage between what students learn in the classroom to what they need to know when making informed career choices, and provide students the opportunity for career awareness and exploration of careers in industry.

The fifteen most prominent industry sectors reflected in the California economy are: Agriculture and Natural Resources; Arts, Media and Entertainment; Building Trades and Construction; Energy and Utilities; Engineering and Design; Fashion and Interiors; Finance and Business; Health and Human Services; Hospitality, Tourism and Recreation; Manufacturing and Product Development; Public and Private Education Services; Public Services; Retail and Wholesale Trade; Transportation; and **Information Technology**.

Information Technology Occupations

The four career path clusters in the Information Technology industry sector are based on research and align occupational opportunities projected by government and employment agencies. According to the California Employment Development Department Labor Market Info, five of the top ten occupations are related to the Information Technology industry sector. An excellent resource for detailed information on the occupations is the Occupational Information Network and their website is <http://online.onetcenter.org/>. Included in this document are two listings of related occupations: (1) O*Net Occupations by Career Path and (2) Occupational Specializations by Career Path.

Information Technology Industry Sector Standards

The purpose of the industry sector standards is to ensure that standards are consistent with industry practices and that these educational programs prepare students for entry into a career field, as well as prepare them for postsecondary education. Focus groups consisting of educators, business partners and academic administrators were established to review the current state and national guidelines on industry sector standards. The objective of the focus group was to review and determine the appropriate state skill standards for the “Information Technology” industry sector. After the focus group determined their expectations for the standards, the standards were posted on the Business Education Resource Consortium website for field review. After input from the field, the standards were finalized.

Assessment Matrix

To prepare for the development of standards-based curriculum, teachers should reflect on what standards are currently being taught in their courses/programs. The *Assessment Matrix* provides a means for educators to assess what standards, if any, are currently addressed in the curriculum. The matrix lists each Information Technology Standard and benchmark with spaces for inserting course titles and indicating in which of these courses each benchmark is addressed. It is generally more effective to complete the matrix as a department or in an interdisciplinary setting. When completing the matrix, educators may delineate whether the standard is being addressed as a primary (p) or secondary (s) component of instruction. Using symbols, such as “+” for standard is fully covered, “[” for standards is partially covered and “-” for standard is not covered is an alternative method for determining whether

standards are adequately addressed in the current curriculum. The matrix for Information Technology is provided in this document.

Once the *Assessment Matrix* is completed, teachers can evaluate the importance and emphasis of standards currently being taught, determine whether there are omissions, and decide which standards should be replaced, deleted, or added. Once these determinations have been made, curriculum will need to be revised accordingly to align with the selected standards. Aligning standards to classroom practices takes time, practice, and the exercise of professional leadership and judgment. Teaching to standards and making sure students can demonstrate understanding is generally more time-consuming than traditional teaching, especially if time-intensive performance assessments such as portfolios and projects are utilized. However, the time and effort expended is worthwhile when the goal is to provide students with multiple opportunities to learn and master the standards.

Academic Core Crosswalk

Another tool that will be very helpful to business teachers as well as academic teachers is the *Information Technology/Academic Core Crosswalk*. This crosswalk was developed to assist teachers in identifying standards and benchmarks that correlate with the academic standards. Each Information Technology standard and benchmark is cross-referenced to the academic content standards.

While it is still necessary to determine whether each specific classroom activity meets the related academic standard that is listed, this crosswalk can reduce the amount of time needed in studying academic standards by the business

instructor. The academic standards in the crosswalk are identified by page number. The page numbers are from the following editions of the standards:

- *English-Language Arts Content Standards for California Public Schools, Kindergarten through Grade Twelve*, Adopted by the California State Board of Education December 1997, Copyright 1998.
- *Mathematics Content Standards for California Public Schools, Kindergarten through Grade Twelve*, Adopted by the California State Board of Education December 1997, Copyright 1999.
- *History-Social Science Content Standards for California Public Schools, Kindergarten through Grade Twelve*, Adopted by the California State Board of Education October 1998, Copyright 2000.
- *Science Content Standards for California Public Schools, Kindergarten through Grade Twelve*, Adopted by the California State Board of Education October 1998, Copyright 2000.

The standards that are listed in **Bold** in the crosswalk are the standards that have been identified in the California High School Exit Examination Blueprint, December 2000.

Industry Certifications

The Information Technology standards were linked to various certifications in the Information Technology profession. The certifications included in the *Guide to Certifications* document were selected based on industry acceptance, popularity and potential growth opportunities. These certifications are only a sampling of the many certifications available in the information technology profession.

The Information Technology (IT) Industry Sector Standards have been formatted into matrices, with each matrix representing one or more certifications within the Information Technology sector. Each matrix cross-references the IT standards to exam objectives or study outlines provided by the credentialing source. Activities can then be designed by educators to prepare students to meet the exam objectives as well as master the corresponding standard. A sample of the *Guide to Certifications* is included in this document as a reference. For more information on credentialing procedures and requirements, please contact the credentialing source. A list of websites is included.

**INFORMATION TECHNOLOGY INDUSTRY SECTOR
O*NET OCCUPATIONS BY CAREER PATH**

Information Support and Services	Media Support and Services	Network Communications	Programming and Systems Development
Data Administrator Computer Systems Analyst Operations Research Analyst Computer Security Specialist Desktop Publishers Technical Writers Editors Computer Support Specialist Computer and Information Systems Manager Computer Software Engineers, Applications Computer Software Engineers, Systems Software Network Systems and Data Communications Analysts Operations Research Analyst Marketing Managers	Multi-media Artists and Animator Audio and Video Equipment Technician Graphic Designer Technical Writer Producer Network and Computer System Administrator Computer Software Engineer, Applications	Network Systems and Data Communications Analyst Network and Computer Systems Administrator Computer Software Engineer, Systems Software Computer Systems Analyst Computer Security Specialist Computer Support Specialist	Computer Software Engineer, Applications Operations Research Analyst Computer Software Engineer, Systems Software Network Systems and Data Communications Analyst Computer and Information Systems Manager Computer Programmers Network and Computer Systems Administrator Computer Support Specialist

**INFORMATION TECHNOLOGY INDUSTRY SECTOR
OCCUPATIONAL SPECIALIZATIONS BY CAREER PATH**

Information Support and Services	Media Support and Services	Network Communications	Programming and Systems Development
Data Administrator	Artist, 2D/3D	Network Systems Communications Analyst	Applications Analyst
Data Analyst	Animator	Network Systems Data Communications Analyst	Applications Engineer
Data Architect	Audio/Video Engineer	Network Information Systems Administrator	Applications Business Analyst
Data Management Associate	Digital Media Designer	Network Information Systems Operator	Applications Computer Engineer
Data Modeler	Digital Media Specialist	Network Information Systems Engineer,	Applications Data Modeler
Data Modeling Specialist	Media/Instructional Designer	Network Administrator	Operating Systems Designer/Engineer
Database Administration Associate	Multimedia Author	Network Analyst	Operating Systems Programmer/Analyst
Database Administrator	Multimedia Authoring Specialist	Network Architect	Operating Systems Program Manager
Database Analyst	Multimedia Developer	Network Engineer	Operating Systems Programmer
Database Developer	Multimedia Specialist	Network Manager	Operating Systems Programmer/Analyst
Database Manager	Multimedia Producer	Network Operations Analyst	Operating Systems Project Lead
Database Security Expert	Multimedia Production Assistant	Network Security Analyst	Software Applications Specialist
Database Decision Support Services	Streaming Media Specialist	Network Specialist	Software Applications Architect
Database Knowledge Architect	Virtual Reality Specialist	Network Technician	Software Applications Design Engineer
Senior Database Administrator	Web Designer	Network Transport Administrator	Software Applications Development Engineer
Database Systems Analyst	Web Producer	Network PC Support Specialist	Software Applications Engineer
Database Systems Administrator	Web Administrator	Network Systems Support Lead	Software Applications QA Specialist
Database Analyst	Web Architect	Systems Administrator	Software Applications Tester
Database Tester	Web Designer	Systems Engineer	Systems Analyst
Desktop Publisher	Web Page Developer	Systems Technical Support Specialist	Systems Administrator
Documentation Specialist	Web Producer	Systems User Support Specialist	Systems Test Engineer
Electronic Publications Specialist	Web Site Developer	Telecommunications Network Technician	Systems Tester
Electronic Publisher	Web Specialist		
Instructional Designer	Webmaster		
Online Publisher			
Technical Editor			
Publications Manager			
Technical Writer			
Technical Support Analyst			
Call Center Support Representative			

Information Support and Services	Media Support and Services	Network Communications	Programming and Systems Development
Technical Support Content Manager Customer Liaison Customer Service Representative Customer Service Professional Help Desk Specialist Help Desk Technician Help Desk Maintenance Technician Help Desk PC Support Specialist Help Desk PC Systems Coordinator Help Desk Product Support Engineer Help Desk Sales Support Technician Help Desk Systems Analyst Technical Account Manager Technical Support Engineer Technical Support Representative Technical Testing Engineer Application Integrator Business Continuity Analyst Cross-Enterprise Integrator Data Systems Designer Data Systems Manager Data Warehouse Designer E-Business Specialist Electronic Transactions Implementers Information Systems Architect, Planner Systems Analyst Systems Architect Systems Integrator			