High School
Internet and Web Page
Applications
Curriculum Essentials
Document

Boulder Valley School District
Department of CTEC
March 2012
Introduction

Students begin the class by learning basic HTML, the code and building blocks behind creating web pages. Once that skill is mastered they are introduced to page layout using CSS, Cascading Style sheets. Students are introduced to Adobe Dreamweaver and accompany Adobe image processing software. Basic image processing and manipulation techniques and software will be introduced. General elements of design are discussed including symmetry, balance, color matching. Copyright rules will be discussed as to what is appropriate and what is not appropriate to place on a webpage. Social media will be used to share data and students will design and maintain personal blog sites they will be expected to maintain. Basic interactive tools such as PHP and MySQL applications will be demonstrated and used in creating dynamic web based applications.
# Internet and Web Page Applications Overview

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<tr>
<th>Course Description</th>
<th>Topics at a Glance</th>
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| This course is designed to provide students the opportunity to apply programming skills to web development. | • HTML Coding  
• Links, Graphics and formatted text using HTML  
• Image Processing  
• Creating Banners for web applications  
• Blogging  
• Formatting using Cascading Style  
• Design considerations-font choice, color matching, effective use of space  
• analytics  
• Introduction to php and mysql applications |

<table>
<thead>
<tr>
<th>Assessments</th>
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| Pages created and assess include:  
• Simple HTML  
• Applied CSS  
• Page including original graphics  
• Blog-updated weekly  
• Blog with comment box |
Prepared Graduates

The preschool through twelfth-grade concepts and skills that all students who complete the Colorado education system must master to ensure their success in a postsecondary and workforce setting.

1. CTE Essential Skills: Academic Foundations

ESSK.01: Achieve additional academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within a career cluster.

Prepared Graduate Competencies in the CTE Essential Skills standard:

- Complete required training, education, and certification to prepare for employment in a particular career field
- Demonstrate language arts, mathematics, and scientific knowledge and skills required to pursue the full range of post-secondary and career opportunities

2. CTE Essential Skills: Communications Standards

ESSK.02: Use oral and written communication skills in creating, expressing, and interrupting information and ideas, including technical terminology and information

Prepared Graduate Competencies in the CTE Essential Skills standard:

- Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice
- Demonstrate use of concepts, strategies, and systems for obtaining and conveying ideas and information to enhance communication in the workplace

3. CTE Essential Skills: Problem Solving and Critical Thinking

ESSK.03: Solve problems using critical thinking skills (analyze, synthesize, and evaluate) independently and in teams using creativity and innovation.
Prepared Graduate Competencies in the CTE Essential Skills standard:

- Employ critical thinking skills independently and in teams to solve problems and make decisions
- Employ critical thinking and interpersonal skills to resolve conflicts with staff and/or customers
- Conduct technical research to gather information necessary for decision-making

4. CTE Essential Skills: Safety, Health, and Environmental

ESSK.06: Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance

Prepared Graduate Competencies in the CTE Essential Skills standard:

- Implement personal and jobsite safety rules and regulations to maintain safe and helpful working conditions and environment
- Complete work tasks in accordance with employee rights and responsibilities and employers obligations to maintain workplace safety and health

5. CTE Essential Skills: Leadership and Teamwork

ESSK.07: Use leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives

Prepared Graduate Competencies in the CTE Essential Skills standard:

- Employ leadership skills to accomplish organizational skills and objectives
6. CTE Essential Skills: Employability and Career Development

ESSK.09: Know and understand the importance of employability skills; explore, plan, and effectively manage careers; know and understand the importance of entrepreneurship skills

Prepared Graduate Competencies in the CTE Essential Skills standard:

- Identify and demonstrate positive work behaviors and personal qualities needed to be employable
- Develop skills related to seeking and applying for employment to find and obtain a desired job
COLORADO COMMUNITY COLLEGE SYSTEM CAREER & TECHNICAL EDUCATION TECHNICAL STANDARDS
REVISION & ACADEMIC ALIGNMENT PROCESS

Colorado’s 21st Century Career & Technical Education Programs have evolved beyond the historic perception of vocational education. They are Colorado’s best kept secret for:

- Relevant & rigorous learning
- Raising achievement among all students
- Strengthening Colorado’s workforce & economy

Colorado Career & Technical Education serves more than 116,000 Colorado secondary students annually through 1,200 programs in 160 school districts, 270 High Schools, 8 Technical Centers, 16 Community Colleges & 3 Technical Colleges. One of every three Colorado high school students gains valuable experiences by their enrollment in these programs.

ALIGNMENT REQUIRED BY SB 08-212

22-7-1005. Preschool through elementary and secondary education - aligned standards - adoption - revisions.

2(b): In developing the preschool through elementary and secondary education standards, the State Board shall also take into account any Career & Technical Education standards adopted by the State Board for Community Colleges and Occupational Education, created in Section 23-60-104, C.R.S., and, to the extent practicable, shall align the appropriate portions of the preschool through elementary and secondary education standards with the Career and Technical standards.

STANDARDS REVIEW AND ALIGNMENT PROCESS

Beginning in the fall of 2008, the Colorado Community College System conducted an intensive standards review and alignment process that involved:

NATIONAL BENCHMARK REVIEW

Colorado Career & Technical Education recently adopted the Career Cluster and Pathway Model endorsed by the United State Department of Education, Division of Adult and Technical Education. This model provided access to a national set of business and industry validated knowledge and skill statements for 16 of the 17 cluster areas. California and Ohio provided the comparative standards for the Energy cluster

- Based on this review Colorado CTE has moved from program-specific to Cluster & Pathway based standards and outcomes

- In addition, we arrived at fewer, higher, clearer and more transferrable standards, expectations and outcomes.

COLORADO CONTENT TEAMS REVIEW

The review, benchmarking and adjusting of the Colorado Cluster and Pathway standards, expectations and outcomes was through the dedicated work of Content Teams comprised of secondary and postsecondary faculty from across the state. Participation by instructors from each level ensured competency alignment between secondary and postsecondary programs. These individuals also proposed the draft academic
alignments for math, science reading, writing and communication, social studies (including Personal Financial Literacy) and post secondary and workforce readiness (PWR.)
ACADEMIC ALIGNMENT REVIEW

In order to validate the alignment of the academic standards to the Career & Technical Education standards, subject matter experts in math, science, reading, writing and communication, and social studies were partnered with career & technical educators to determine if and when a true alignment existed.

CURRENT STATUS

• One set of aligned Essential skills to drive Postsecondary and Workforce Readiness inclusion in all Career & Technical Education programs.

• 52 pathways with validated academic alignments

• 12 pathways with revised standards ready for alignment (currently there are no approved programs in these pathways)

• 21 pathways where no secondary programming currently exists. Standards and alignments will be developed as programs emerge.

• Available for review at: www.coloradostateplan.com/content_standards.htm
Colorado Career & Technical Education Standards Academic Alignment Reference System

The Career & Technical Education standards have been organized by Career Cluster (17) and Pathway (81). In addition, a set of “Essential Skills” was developed to ensure the Postsecondary and Workforce Readiness within any cluster or pathway. These workforce readiness skills are applicable to all career clusters and should form the basis of each CTE program.

Organization

Essential Skills
There exists a common set of knowledge and skills that are applicable to all students regardless of which cluster or pathway they choose. This set of standards, is meant for inclusion in each program to enhance the development of postsecondary and workforce readiness skills.

Career Cluster
A Career Cluster is a grouping of occupations and broad industries based on commonalities. The 17 Career Clusters organize academic and occupational knowledge and skills into a coherent course sequence and identify pathways from secondary schools to two- and four-year colleges, graduate schools, and the workplace. Students learn in school about what they can do in the future. This connection to future goals motivates students to work harder and enroll in more rigorous courses.

Career Pathway
Pathways are sub-groupings of occupations/career specialties used as an organizing tool for curriculum design and instruction. Occupations/career specialties are grouped into Pathways based on the fact that they require a set of common knowledge and skills for career success.

Prepared Completer Competency
This level targets the “big ideas” in each pathway. These are the competencies that all students who complete a CTE pathway must master to ensure their success in a postsecondary and workforce setting. Prepared Completer Competencies will not usually be “course” specific but grow with the student’s progression through the sequence of courses.

Concept/Skill
The articulation of the concepts and skills that indicates a student is making progress toward being a prepared completer. They answer the question: What do students need to know and be able to do?

Evidence Outcome
The indication that a student is meeting an expectation at the mastery level. How do we know that a student can do it?
Academic Alignments

Academic alignments, where appropriate in Math, Reading, Writing and Communication, Science and Social Studies (including Personal Financial Literacy) were defined by CTE and academic subject matter experts using the following criteria:

- It was a point where technical and academic content naturally collided;
- The student must demonstrate adequate proficiency with the academic standard to perform the technical skill; and
- It could be assessed for both academic and technical understanding.

Colorado’s CTE programs have had academic alignments dating back to the early 1990’s. While these alignments resulted in an increase in academic focus in CTE programs, the reality is that a true transformation in intentional teaching toward the academic standard was limited.

With these alignments comes a new expectation: If a CTE instructor is teaching a CTE concept that has an identified alignment, they must also be intentional about their instruction of the academic standard. CCCS will be providing professional development and instructional resources to assist with the successful implementation of this new expectation. In addition, this expanded expectation will require increased collaboration between CTE and academic instructors to transform teaching and learning throughout each school.

For each set of Cluster and Pathway standards, the academic alignments have been included and are separated by academic area. CCCS chose to align at the “Evidence Outcome” level. The aligned academic evidence outcome follows the CTE evidence outcome to which it has been aligned. For a sample, see Illustration A.
**Illustration A**

AGBS.01 The student will describe agribusinesses, the relationship of agribusiness to the industry of agriculture and will identify opportunities in the agribusiness systems pathway

AGBS.01.a The student will understand the history and global significance of agribusinesses

AGBS.01.a.b Define the major trends and relationship of agribusiness to global agriculture production

MA380-GR.HS.S.1 GLE.1-EO.a Reason quantitatively and use units to solve problems (CCSS. N-Q)

The academic standard number used in the alignments matches the Colorado Department of Education standards numbering convention.
## Career Pathway Abbreviations

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Internet and Web Page Applications

**ITIM.01** Understand and implement the design and development process for the production of quality interactive media.

**ITIM.01.01** Gather data to identify customer requirements and assess customer needs based on competition.

- **ITIM.01.01.a** Use survey/interview tools to identify customer requirements.
- **ITIM.01.01.b** Use assessment tools to compare competitor approaches.
- **ITIM.01.01.c** Integrate needs and assessments into a unique solution to the project design.

**ITIM.01.02** Define scope of work to meet customer requirements.

- **ITIM.01.02.b** Determine the target audience requirements (such as web accessibility).
- **ITIM.01.02.c** Identify available media and content sources.

**ITIM.01.03** Create final project plan.

- **ITIM.01.03.a** Identify and obtain tools and resources to do the job.
- **ITIM.01.03.b** Identify and evaluate risks.
- **ITIM.01.03.c** Develop detailed task list.
- **ITIM.01.03.d** Identify critical milestones.
- **ITIM.01.03.e** Identify technical constraints.
- **ITIM.01.03.f** Identify interdependencies.

**ITIM.01.04** Analyze usability and accessibility as it pertains to customer needs.
ITIM.01.04.b Demonstrate knowledge of web metrics and governance (policies and stylebooks).

ITIM.01.04.d Explain the importance of ethical behaviors and legal issues.

ITIM.01.04.e Consider intellectual property issues in the production of interactive media.

ITIM.02 Understand and demonstrate the use of software and hardware for digital communication production, development and project management.

ITIM.02.01 Demonstrate the ability to work with appropriate software tools.

ITIM.02.01.a Demonstrate proficiency in the use of digital imaging tools, digital video techniques, and equipment. (i.e. bitmapped image editing, vector based editing, layers, channels, masks, etc).

ITIM.02.01.b Demonstrate knowledge of available graphics, video, motion graphics, web software programs.

ITIM.02.01.d Demonstrate knowledge of integrated development environments (such as Visual Studio, Dreamweaver, Flash, Waterproof, etc).

ITIM.02.01.f Demonstrate knowledge of the basic principles of motion graphics.

ITIM.02.01.g Identify how different user agents (browsers, devices) affect the digital communication product.

ITIM.02.02 Utilize the design principles and elements used to create a uniform interactive media product.

ITIM.02.02.a Use design elements such as shape, space, lines, size, color, texture, and typography, proportion, balance, scale to create an effective media product.

ITIM.02.02.b Use design support principles such as unity, variety, hierarchy, proportion, balance, scale, rhythm, and repetition to create an effective media product.

ITIM.02.03 Identify and utilize appropriate hardware configuration and tools.

ITIM.02.03.a Identify appropriate tools for creating computer graphics (3 button mouse, tablet, graphics card).

ITIM.02.04 Employ knowledge of Web design, programming, and administration to develop Web applications.

ITIM.02.04.a Utilize basic web development skills (i.e. version control, security, compatibility, standards).

ITIM.02.04.b Demonstrate knowledge of basic Web programming and scripting languages (i.e. HTML, CSS, Javascript, .NET, PHP, etc.).

ITIM.02.04.c Explain Internet architecture elements.
ITIM.02.04.d  Demonstrate knowledge of a server environment and how to interface client/server (i.e. protocols, hardware, software, domains, service providers, search engines).

STCO.01  Understand and demonstrate the characteristics, scope and core concepts of technology.

STCO.01.01  Understand and apply tools, materials and processes.

STCO.01.01.a  Apply and create an appropriate process for an assigned situation to solve a real world problem, using tools and materials.

STCO.01.01.b  Interpret of results of a study, including inferences and predictions. - Define and explain the meaning of significance (both practical and statistical).

STCO.01.02  Apply characteristics of technology.

STCO.01.02.a  Analyze rate, goal and commercialization of technology through a production process.

STCO.01.03  Use the appropriate technology to determine scope.

STCO.01.03.a  Demonstrate the ability to formulate results by the collection and interpretation of data.

STCO.01.04  Identify and apply the core concepts of technology.

STCO.01.04.a  Demonstrate the ability to characterize a plan and identify the necessary tools that will produce a technical solution when given a problem statement.

STCO.01.04.b  Describe the elements of good engineering practice (e.g. understanding customer needs, planning requirements, analysis, using appropriate tools and materials, prototyping, test, evaluation and verification.

STCO.01.04.c  Effectively use project management techniques (including, but not limited to, time management practices, effective organizational skills, conduct analysis of cost, resources, and production capability and quality practices with continuous improvement

STCO.01.04.d  Apply knowledge of scientific development to solve real world technical applications.

STCO.05.02  Implement trouble shooting techniques in problem solving.

STCO.05.02.a  Gather knowledge to correct issues relevant to use and preventative maintenance. (the noisy belt, leaking window, screws to repair human joints, Hubble telescope).

STCO.05.02.b  Analyze and interpret prior knowledge of tools, materials and processes to create a plan of action.

STCO.05.02.c  Gather, analyze and interpret data and graphs regarding position, velocity and acceleration of moving objects.
STCO.05.02.d Develop new ideas to solve and eliminate recurring issues.

STCO.06.02 Use the attributes of design.

STCO.06.02.a Understand that design is a creative planning process that leads to useful products and systems.

STCO.06.02.b Explain how the requirements of a design, such as criteria, constraints, and efficiencies sometimes compete with each other.

STCO.06.03 Utilize the design process.

STCO.06.03.a Demonstrate the design process by defining a problem, brainstorming, researching and generating ideas, identifying criteria and specifying constraints, and exploring possibilities.

STCO.06.03.b Select an approach, develop a design proposal, make a model or prototype, test and evaluate the design using specifications, refine the design, create or make it, and communicate processes and results.

STCO.06.03.c Understand that the design needs to be continually checked and critiqued, and the ideas of the design must be redefined and improved.
Glossary

• **ASP**
  Short for Active Server Pages that is used for creating dynamic content of a web page. Technically said it is a server side scripting language. It is mostly used on Windows platforms.

• **Bandwidth**
  Bandwidth is the maximum amount of data that can travel a communications path in a given time, usually measured in seconds. If you think of the communications path as a pipe, then bandwidth represents the width of the pipe that determines how much data can flow through it all at once.

• **Banner**
  Also referred to as a banner ad, a banner is a typically rectangular advertisement placed on a Web site either above, below or on the sides of the Web site's main content and is linked to the advertiser's own Web site.

• **Browser**
  Very often called Web browser, a software application used to locate and display Web pages. The two most popular browsers are Microsoft Internet Explorer and Netscape Navigator. There are many other browsers like AOL Browser, Opera, NeoPlanet and many others.

• **Database**
  A special way of organizing computer data. It looks like a table implemented columns and rows for fast accessing data from any of the cells in the table. There are many different types of databases but all of them work on the same principle. Databases are very useful for storing and organizing data for later retrieval. Very often used for managing accounts, managing user information, creating guest books and bulletin boards, even this page (dictionary) is implemented with database.

• **Discussion Group**
  A web page that supports interactive discussions by users. Users submit text content using a form, that is saved on the server and that way make it available to other visitors.

• **DNS**
  The Domain Name System which identifies each computer as a network point on the Internet using an internet protocol address systems to translate from domain name to IP and reverse.

• **Domain Name**
  A unique name that identifies one or more IP addresses. For example, the domain name abacus.ca represents one IP address. Domain names are used in URLs to identify particular Web pages. Every web site that you visit is stored under domain name.

• **Downloading**
  Downloading is the method by which users access and save or "pull down" software or other files to their own computers from a remote computer, usually via a modem.

• **E-Commerce**
  E-Commerce means conducting business on the Internet. It is mostly referred to buying and selling items on line.

• **Encryption**
A way of coding the information in a file or e-mail message so that if it is intercepted by a third party as it travels over a network it cannot be read. Only the persons sending and receiving the information have the key and this makes it unreadable to anyone except those persons (your browser does it automatically).

- **Flash**
  Browser independent vector and graphic animation technology owned by Macromedia Inc.. Most browsers support Flash technology and one flash animation looks the same on all browsers.

- **FTP**
  FTP stands for File Transfer Protocol which is one of the methods of transferring files over the Internet.

- **GIF**
  GIF stands for graphics interchange format, it is a bit-mapped graphics file format used by the World Wide Web. GIF supports colour and various resolutions. But it is limited to 256 colors.

- **Home Page**
  It is a first page (also called opening page) of a Web site.

- **Hosting**
  Hosting is a service provided by hosting company. That's a place (a computer available on the Internet) where web site is stored and made available to web site users to view the content of that web site.

- **HTML**
  Stands for HyperText Markup Language, the authoring and editing language used to create web pages on the World Wide Web.

- **Internet**
  The largest global network connecting millions of computers. It is strictly based on TCP/IP protocol for communication between host and server.

- **Intranet**
  A private network belonging to an organization, usually a corporation, accessible only by the organization's members, employees, or others with authorization.

- **IP Address**
  An IP (Internet Protocol) address is a unique identifier for a point or host connection on an IP network. An IP address is a 32 bit binary number usually represented as 4 decimal values, each representing 8 bits, in the range 0 to 255 (known as octets) separated by decimal points. It is just a number like 66.46.105.9

- **Java applet**
  A short program written in Java (not JavaScript) that is attached to a World Wide Web page and executed by the browser machine. Often used for complicated web applications.

- **JavaScript**
  JavaScript is a client-side scripting language that allows dynamic behavior to be specified within HTML documents. Most browsers support java however some browsers are disabled for JavaScript use.

- **JPEG (JPG)**
  Stands for Joint Photographic Experts Group. JPEG uses compression technique for color images and therefore some details are lost in the compression yet giving relatively good quality. It is widely used on
the Internet and other digital applications.

- **Link**
  Sometimes called hyperlink. A link is object on the web page. When visitor of a web site click with the mouse on that object then user is taken to another web page where the link is pointing to. Different types of links are: text links, graphic links, java links, form links and some other which are not very important.

- **MP3**
  MP3 is the file extension for MPEG, audio layer 3. Layer 3 is one of three coding schemes (layer 1, layer 2 and layer 3) for the compression of audio signals. MP3 files could be embedded into web site providing music while visitors are viewing the site. MP3 files are relatively small comparing to other audio files and therefore are quite suitable for transferring over the Internet.

- **PHP**
  PHP Hypertext Preprocessor is a server-side, HTML embedded scripting language used to create dynamic Web pages. Designed for Windows and Unix type platforms.

- **Protocol**
  A formal set of conventions that allow communication between two communicating functional units. Simply said it is a language that computers use to talk to each other. Of course there are many such languages. Most popular is TCP/IP used officially on the Internet.

- **Search Engine**
  A program that performs searching on documents for specified terms or phrases and returns a list of the documents where those terms were found. Search Engines are lately referred to Internet Search Engines. Most popular search engines today are Google, Yahoo, MSN, AllTheWeb, Excite, Lycos, AOL, HotBot, Altavista. There are over several thousands search engines and growing every day.

- **Search Engine Optimization**
  Search Engine Optimization (SEO) is an act of of increasing the the number of visitors to a particular Web site by adding appropriate keywords and phrases, and such ranking high in the search results. The higher a Web site ranks in the results of a search, the greater the chance that your site will be found by a search user. For general and competitive web sites it takes a lot of professionalism to tweak the web site in order to be well optimized and search engine friendly.

- **Spam**
  Spam refers to the practice of blindly sending commercial messages or advertisements to email users or posting to newsgroups.

- **Submission Forms**
  Forms are web pages "fields" for a user to fill in with information. They are an excellent way of collecting and processing information from people visiting a website, as well as allowing them to interact with web pages. Forms are written in HTML and processed by CGI programs. The output can be sent as an e-mail form, stored online, printed, and/or returned to the user as an HTML page.

- **Thumbnail**
  A small version of a bigger image on a web page. Usually containing a hyperlink to a full-size version of the image.

- **URL**

It stands for Uniform Resource Locator, which is a string that supplies the Internet address of a resource on the World Wide Web, along with the protocol by which the resource is accessed. The most common URL type is "http," which gives the Internet address of a World Wide Web page. Some other URL types are gopher and ftp.

- **Video Clip**
  A short video sequence that can be embedded into a web page.

- **Web Application**
  Web Applications are web programs or real programs designed to be used on the web site using a browser. Example of web application would be e-commerce web site, web banking, stock exchange on the web, web games and many others. Web applications are becoming very popular due to wide availability of the Internet access.

- **Web Based E-mail**
  Web based e-mail is a software on a POP3 server that allows you the luxury, if desired, to access your POP accounts by simply using a web-browser. It allows users to send and receive emails via any web-browser by viewing an HTML web page.

- **Web Page**
  One of the pages one the web site including home page.

- **Web Site**
  A site presence on the World Wide Web. Each Web site contains a home page (opening page), which is the first document users see when they enter the site.

- **World Wide Web**
  A system of Internet servers that support specially formatted documents. The documents are formatted in a script called HTML (HyperText Markup Language) that supports links to other documents, as well as graphics, audio, and video files. This means you can jump from one document to another simply by clicking on hot spots. Not all Internet servers are part of the World Wide Web.