INTRODUCTION TO DIGITAL VIDEO PRODUCTION

Course Description

Introduction to Digital Video Production is designed to give students the opportunity to create presentations using videography—the process of recording sound and visual images on electronic media. Fieldwork involving school activities will provide students with experiences working with digital photography enhancements and capturing video as well as interacting with others by interviewing participants. Students develop skills in video production using the technologies of audio-video equipment and computer-based editing software. These are implemented to produce digital media projects for all areas of everyday life. Principles of video basics, DV technology, the development and creative process, editing, production, effects and presentation are stressed. Opportunities for creativity, problem solving, individual and group interaction, and decision making are incorporated. Basic understanding of computer use and software operation is assumed.

Recommended for: All students
Course length: Half year
Credits: .5
Level: III

Introduction to Digital Video Production may be taken to satisfy the graduation requirement in art.

Goals

- Promote basic understanding of videography concepts and techniques
- Learn basic video editing terminology
- Develop skill in the preparation of video editing in a technological and global society
- Apply high standards of communication in the preparation of video editing projects
- Foster ethics and attitudes to ensure personal, group, and career achievements
- Develop work strategies to include analysis, priorities, decisions, resolutions, production, efficiency, and time frames
- Practice oral, written and tutorial (written, audio, video types) directions

- Provide opportunities for continuing skill development progressing from basic editing of digital photos and video to more advanced projects of combining audio, photos, video, and applying text and special effects into a professional quality DVD
- Encourage creativity in planning and preparing a multi-faceted project
- Cultivate an appreciation of the value of the computer as a lifetime tool for future higher education and avocation
- Develop DVD basics with an understanding of hardware and software used in the creation process
- Understand the DVD menu design including structure, style, design, and production guidelines, usability, and video compositing
- Use digital video equipment to produce photos and video to be used in project creation
- Develop DVD planning, encoding, authoring, testing, and duplication of projects
- Work with both Windows-based and Mac-based formats
- Promote the ethical use of the computer—including but not limited to plagiarizing and copyrighted material

Competencies

- Understand key concepts and terminology used in the development of a videography project
- Recognize the difference between collections, projects, and movies
- Understand the source files used in videography in the form of digital media files and pictures
- Work with the different types of capture devices for audio and video
- Capture video from a digital source (digital camera, digital camcorder, or DVD recorder).
- Capture audio from an external source to a computer using different types of microphones or audio capture cards
- Connect different types of capture devices (audio and video) to the computer in formats compatible with the software

- Understand video settings of capture sources in relation to delivery method of final saved movie, capturing quality, hard disk space available, and audio and video content

- Learn to improve the creation of a video in relation to background, lighting, subject composition, and stability of equipment

- Incorporate methods to improve flaws in video such as over saturation or too bright or too dark

- Incorporate methods to improve the creation of audio with relation to ambient noise and microphone usage

- Understand the files supported by the software in use and be able to convert files to usable files for that software in the areas of audio, picture and video

- Know and use the menu bars, toolbars, panes, storyboards, and timelines for videography in computer programs

- Work with and understand the movie tasks, collections, and contents pane of a videography program

- Work with and understand the storyboard and timeline of a videography program

- Transfer video and audio in the format of digital video, analog video, video recorders, TV card tuner or a microphone to a videography program

- Troubleshoot problems that develop from capturing video

- Take a picture of a video in the monitor and use in the videography program

- Import video from existing digital media files

- Understand the process of saving a project and the components that will be retained in this process

- Preview a project and clips by jumping to a frame or clip and display the clip or project with properties

- Facilitate the editing project process of the storyboard/timeline by adding a clip, removing a clip, zooming in and out, moving and copying clips, undoing actions and using an auto move feature

- Edit clips by being able to split, combine and trim a clip

- Understand video transitioning from one video or picture to another
- Understand video effects of how a video, clip, picture, or title displays in the project and final movie
- Add titles and credits to enhance movie by adding text-based information to the movie
- Work with audio by being able to create a narration for the timeline, adjust audio levels, add audio effects, and adjust the volume of audio clips
- Organize the collections and clips into event categories (video clips and pictures, audio, video effects and transitions) for future projects
- Save the finished movie to a recordable DVD or record the movie to a DV tape in a video camera, or compressed video for the web.
- Use general and advanced options to configure the settings to meet the needs of the project
- Apply the use of different types of digital cameras to capture video and pictures (Digital-8, DV mini and digital photos)
- Apply the use of different types of audio equipment to capture audio with microphones and insert audio through the computer
- Incorporate elements of good project design—gathering video and audio by interviewing, recording, photographing, and organizing video and audio clips
- Exhibit individual effort and preservation as well as contributing to group/team projects
- Maintain a portfolio of individual and group work
- Demonstrate respect for computer equipment
- Consider basic principles of video graphic journalism in project presentation

Course Content

I. Introduction of Equipment

   A. Use of Video Equipment
      1. Digital Camcorder (8mm—Digital-8 format)
      2. Digital Camcorder (DV mini format)
      3. Digital Camera (Digital photos—5 mega pixels)
   B. Use of Audio Equipment

1. Tape Recorder and Microphone
2. Microphone with Camcorder
3. Microphone with Computer
4. Imported Computer Files
5. Music Files

C. Computer
1. Windows XP Computers
2. Apple Computer

II. Basic Applications of Equipment

A. Introduction of audio and video equipment terminology
B. Introduction to Digital Photography
1. Using a Digital Camera
a. Anatomy of the digital camera
b. Understanding the menus
c. Taking quality photographs
d. Downloading photographs to a computer
e. Getting the right exposure
f. Using built-in camera effects
2. Using Software to Improve and Enhance Photos
a. Using Adobe programs—Photoshop
b. Using Microsoft programs
(1) Check at home
(2) Other Microsoft software

C. Introduction to Digital Video
1. Using a Digital Camcorder
a. Anatomy of a camcorder
(1) Sony Hi-8 format
(2) Panasonic and JVC DV mini format
(3) Panasonic studio VHS analog format
(4) Sony DVD format
b. Focusing Techniques—Auto and Manual
c. Exposures
(1) Auto-exposure and backlight
(2) Low light and night shot
(3) Artificial light, color temperature and white balance
d. Time code
(1) Drop frame
(2) Non-Drop frame
(3) SMPTE engineer standard
e. Using camcorder effects
(1) Black and white
(2) Mosaic
(3) Negative
(4) Pastel

(5) Posterization
(6) Shake
(7) Sepia
(8) Slim
(9) Stretch

f. Using telephoto and wide angle

2. Camcorder shooting techniques
   a. Planning the shoot, shooting to edit and establishing shots
   b. Composition: ECU, CU, MS, LS
   c. Working with background and surroundings
   d. Actions shots, zoom, pan, tilt, crane, dolly
   e. Implementing composition, color and natural light
   f. Understanding difficult lighting situations
   g. Implementing sound recording and audio dubbing
   h. Downloading video to a computer
   i. Organizing the video footage

D. Digital video editing techniques
   1. Video-editing software
      a. Windows format
      b. Macintosh format
   2. Capture—camcorder to computer via Fire-Wire
   3. Rough editing
   4. Trimming clips
   5. Inserting edits
   6. Transitions
   7. Sound editing
   8. Adding sound at the editing stage
   9. Titling
      a. Legibility, fonts
      b. Positioning—title safe zone
      c. Template titles
      d. Illustrated titles
         (1) Decorative fonts and motion
         (2) Animation of stills
   10. Video special effects

III. DV Editing (Windows and Macintosh)

A. Understanding the workspace
B. Working in the project window
   1. List view
   2. Icon view
C. Understanding the monitor window
   1. Prepare clips
   2. Prepare contents of the timeline
D. Examining the timeline elements

1. View options
2. Navigate to specific frames

E. Working with clips
1. Import source files
2. Working with still clips
3. Bringing clips into the timeline
4. Manipulating clips in the timeline

F. Working with transitions
1. Understanding transitions
2. Add transition using the transition palette
3. Add transitions using automate to timeline
4. Modifying transitions
5. Create Multiple Transition Effects

G. Working with audio
1. Prepare audio clips for use
2. Modifying audio clips
3. Export audio clips
4. Use audio clips

H. Exploring essential editing techniques
1. Trim and pre-trim video clips
2. Insert and overlay clips
3. Perform a ripple edit and rolling edit
4. Perform a 3-point edit and 4-point edit
5. Link and unlink clips

I. Exploring advanced editing techniques
1. Using transitions in single-track editing workspace
2. Edit using marker menu
3. Use extracting and lifting
4. Changing a clip’s rate
5. Exploring paste options
6. Using the slide and slip tools
7. Working in the trim mode

J. Working with titles
1. Creating and using titles
2. Creating an opening credits sequence
3. Fading titles and video clips
4. Creating graphic objects
5. Employing crawls and rolls

K. Superimposing Clips
1. Using the multiple key
2. Using the track matte key
3. Removing a background from a clip
4. Using the screen key

L. Animating Clips
1. Applying motion to clips
2. Using the motion timeline

3. Modifying keyframes
4. Working with imported images
5. Transforming animated clips

M. Working with video effects
1. Applying video effects
2. Using advanced video effect techniques
3. Controlling video effects with keyframes
4. Applying video effects to special clip areas
5. Creating duplicate clips
6. Creating virtual clips
7. Nesting virtual clips
8. Editing virtual clips

N. Exploring exports options
1. Export bins
2. Exporting movies and frames
3. Exporting an edit decision list
4. Exporting a filmstrip

IV. DVD Authoring

A. Compression of video (from timeline in NLE edit software)
B. MPEG-2
C. Markers
D. Menu
E. Mapping and links

V. Web-Video

A. Full resolution, broadcast video vs. web video
B. MPEG-4
C. Codecs (compression/decompression schemes)
D. Windows movies (.wmv)
E. Quick-time movies (.mov)
F. File-size, compression and web throughput
G. Saving quality and reducing bit depth (file sz.)

VI. Exam review

Instructional Methodologies

- Preparation of screenwriting documents
- Real world filmmaking situations for locations, lighting, studio
- Exercises and activities using media-company Web sites and interactive media
- Computer software demonstrations
- Computer problems and projects

- Activities using online research of current HDTV technology
- Illustrative problems
- Case studies
- Student notebook (student notes, handouts, sample problems, quizzes and tests)
- Problem-solving activities
- Guest speakers
- Class discussions
- Internet research projects
- Supporting videos
- Newspaper articles
- Tutorials
- Individualized projects
- Small group work and projects
- Peer learning (sharing knowledge and troubleshooting)
- Field work (photography, video, and research)
- Interviews
- Peer proofreading and critiquing
- Project development
- Project analysis (self-evaluation)

Instructional Resources (Students)

Software

- Adobe Premiere Pro, CS3—Encore and OnLocation
- Adobe Audition, 1.5
- Adobe After-Effects, 6.5
- Adobe Photoshop, CS, 8
- Storyboard Quick
- Mac Motion editing software
- Mac Final-Cut Pro video editing, graphics, DVD, authoring software
- Supplementary software programs
- Internet tutorials

Texts

- *Intro to Video Production*, Compesi, Gomez, 2006, Pearson Education, Inc.
- *The Filmmaker's Handbook*, Ascher, Pincus, 2008, Plume/Penguin
- *Adobe Premiere*, Botello, 2004, Thomson Course Technology

- thomsonedu.com/video, adobe.com, apple.com, bhphotovideo.com
- Teacher-prepared materials and projects
- Web sites
- Industry and trade publications
- Tutorials

Teacher Resources

- Instructor's Edition for *Intro to Video Production,* Compesi, Gomez, 2006, Pearson Education, Inc.
- Instructor's Edition for *The Filmmaker's Handbook,* Ascher, Pincus, 2008, Plume/Penguin
- Instructor's Edition for *Adobe Premiere*, Botello, 2004, Thomson Course Technology
- Instructor's materials for software
- Reference texts
- Supplemental transparencies
- Tutorials
- Web sites
- Assorted Instructional Technology and Computer Science reference texts—BITC Dept. Library

Curriculum Map

Term 1/III

Week 1

I. Introduction of Equipment
   A. Use of Video Equipment
   B. Use of Audio Equipment
   C. Computer
      1. Windows XP Computers
      2. Apple Computer

Week2

II. Basic Applications of Equipment
   A. Introduction of audio and video equipment terminology
   B. Introduction to Digital Photography
      1. Using a Digital Camera
      2. Using Software to Improve and Enhance Photos

Week 3

   C. Introduction to Digital Video
      1. Using a Digital Camcorder
         a. Anatomy of a camcorder
         b. Focusing Techniques—Auto and Manual
         c. Exposures
         d. Time code
         e. Using camcorder effects
         f. Using telephoto and wide angle

Week 4

      2. Camcorder shooting techniques
         a. Planning the shoot, shooting to edit and establishing shots
         b. Composition: ECU, CU, MS, LS

c. Working with background and surroundings
d. Actions shots, zoom, pan, tilt, crane, dolly
e. Implementing composition, color and natural light
f. Understanding difficult lighting situations
g. Implementing sound recording and audio dubbing
h. Downloading video to a computer
i. Organizing the video footage

Week 5

D. Digital video editing techniques
1. Video-editing software
a. Windows format
b. Macintosh format
2. Capture—camcorder to computer via Fire-Wire
3. Rough editing
4. Trimming clips
5. Inserting edits
6. Transitions
7. Sound editing
8. Adding sound at the editing stage

Week 6

9. Titling
a. Legibility, fonts
b. Positioning—title safe zone
c. Template titles
d. Illustrated titles
(1) Decorative fonts and motion
(2) Animation of stills
10. Video special effects

Week 7

III. DV Editing (Windows and Macintosh)
A. Understanding the workspace
B. Working in the project window
C. Understanding the monitor window
D. Examining the timeline elements
E. Working with clips
1. Import source files
2. Working with still clips
3. Bringing clips into the timeline
4. Manipulating clips in the timeline

Week 8

F. Working with transitions
1. Understanding transitions
2. Add transition using the transition palette
3. Add transitions using automate to timeline
4. Modifying transitions
5. Create Multiple Transition Effects

Week 9

G. Working with audio
    1. Prepare audio clips for use
    2. Modifying audio clips
    3. Export audio clips
    4. Use audio clips

H. Exploring essential editing techniques
    1. Trim and pre-trim video clips
    2. Insert and overlay clips
    3. Perform a ripple edit and rolling edit
    4. Perform a 3-point edit and 4-point edit
    5. Link and unlink clips

Term II/IV

Week 1

I. Exploring advanced editing techniques
    1. Using transitions in single-track editing workspace
    2. Edit using marker menu
    3. Use extracting and lifting
    4. Changing a clip's rate
    5. Exploring paste options
    6. Using the slide and slip tools
    7. Working in the trim mode

Week 2

J. Working with titles
    1. Creating and using titles
    2. Creating an opening credits sequence
    3. Fading titles and video clips
    4. Creating graphic objects
    5. Employing crawls and rolls

Week 3

K. Superimposing Clips
    1. Using the multiple key
    2. Using the track matte key
    3. Removing a background from a clip
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Week 4

L. Animating Clips
    1. Applying motion to clips
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Week 5

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2. Using advanced video effect techniques
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4. Applying video effects to special clip areas
5. Creating duplicate clips
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Week 6

N. Exploring exports options
   1. Export bins
   2. Exporting movies and frames
   3. Exporting an edit decision list
   4. Exporting a filmstrip

Week 7

IV. DVD Authoring
   A. Compression of video (from timeline in NLE edit software)
   B. MPEG-2
   C. Markers
   D. Menu
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Week 8

V. Web-Video
   A. Full resolution, broadcast video vs. web video
   B. MPEG-4
   C. Codecs (compression/decompression schemes)
   D. Windows movies (.wmv)
   E. Quick-time movies (.mov)
   F. File-size, compression and web throughput
   G. Saving quality and reducing bit depth (file sz.)

Week 9 Exam review

Technology Resources

- Computer laboratory classroom with Internet access (Windows Environment)
- Computer overhead projection system for demonstration
- Standalone Macintosh computer-editing environment
- Software programs including design and editing software (See Instructional Resources)
- *New Perspectives on Computer Concepts*, PowerPoint Presentations
- Simulations
- Tutorials
- HD/SD video cameras, tripods, tape
- DVD, CD-Rom, video media

- Lighting units
- Microphones
- VTR, DVD player, monitors
- DVD Drive—Reading and Burning
- Scanner
- Digital Camcorders w/Companion Software
- Analog Camcorders w/Companion Software

Methods of Assessment

- Text and computer exercises and problems using media and DVD tutorials—group and independent work
- Text discussion questions
- Continuing and comprehensive textbook projects
- Computer problems and projects
- Teacher-prepared and standardized tests, quizzes, and projects
- Homework assignments
- Extra credit assignments
- Enrichment activities
- Class participation
- Rubrics
- Creative components
- Terminology
- Simulations
- Project production—individual and group
- Final examination

Academic Support—Enrichment Topics and Activities

- Independent Video Project Chapter 1—Editing montage of images.
- Independent Video Project Chapter 3—Explore and describe self and lifetime goals.
- Internet research project/summary of findings—research industry technology; camera, computer, lighting, sound, editing, etc.
- Internet project/summary of findings—leading Hollywood HDTV cameras.
- Independent Video Project Chapter 9—PSA on “Health and Fitness in Agawam”
- Independent Video Final-Project—Short Documentary on “School Pride”

Global Awareness/Global Economy

- Globalization of the economy
- Impact of technology
- Transnational companies

- Outsourcing
- U.S. share of the global economy
- Corporate responsibility
- Advantages and disadvantages
- Skills required for career success
- Corporate culture
- Practical aspects of doing business in an international environment
- Production standards and product safety
- Global topics and text activities as preparation for working in a worldwide economy

Massachusetts Technology Literacy Standards and Expectations Reflected in the Course Competencies (208)

Basic Operations

- G9-12: 1.1 Identify the platform, version, properties, function, and interoperability of computing devices including a wide range of devices that compute and/or manage digital media.
- G9-12: 1.2 Use online help and other support to learn about features of hardware and software, as well as to assess and resolve problems.
- G9-12: 1.3 Install and uninstall software; compress and expand files (if the district allows it).
- G9-12: 1.4 Explain effective backup and recovery strategies.
- G9-12: 1.5 Explain criteria for evaluating hardware and software appropriate for a given task (e.g., features, versions, capacity).
- G9-12: 1.6 Demonstrate keyboarding techniques, including the use of keyboard shortcuts, to complete assignments efficiently and accurately. (For students with disabilities, demonstrate alternate input techniques as appropriate.)
- G9-12: 1.7 Identify and assess the capabilities and limitations of emerging technologies.

Word Processing/Desktop Publishing

- G9-12: 1.8 Apply advanced formatting and page layout features when appropriate (e.g., columns, templates, and styles) to improve the appearance of documents and materials.
- G9-12: 1.9 Use editing features appropriately (e.g., track changes, insert comments).
- G9-12: 1.10 Identify the use of word processing and desktop publishing skills in various careers.

Internet, Networking, and Online Communication

- G9-12: 1.27 Use search engines and online directories. Explain the differences among various search engines and how they rank results.
- G9-12: 1.28 Explain and demonstrate effective search strategies for locating and retrieving electronic information (e.g., using syntax and Boolean logic operators).
- G9-12: 1.29 Describe good practices for password protection and authentication.

Multimedia

- G9-12: 1.32 Identify technology tools (e.g., authoring tools) that can be used to create a multimedia product.
- G9-12: 1.33 Use a variety of applications to plan, create, and edit multimedia products (e.g., slide presentations, videos, animations, simulations, podcasts).
- G9-12: 1.34 Link information residing in different applications (e.g., linking a chart in a word-processing document to the spreadsheet where it was created).
- G9-12: 1.35 Identify career options in multimedia and software development.

Ethics

- G9-12: 2.1 Demonstrate compliance with the school's Acceptable Use Policy.
- G9-12: 2.2 Explain issues related to the responsible use of technology (e.g., privacy, security).
- G9-12: 2.3 Explain laws restricting the use of copyrighted materials.
- G9-12: 2.4 Identify examples of plagiarism, and discuss the possible consequences of plagiarizing the work of others.
- G9-12: 2.5 Write correct in-text citations and reference lists for text and images gathered from electronic sources.
- G9-12: 2.6 Give examples of the appropriate and responsible use of communication tools (e.g., chats, instant messaging, blogs, wikis).
- G9-12: 2.7 Discuss misuse of technology for personal and commercial reasons (e.g., software piracy, unauthorized file sharing/downloading, virus spreading, and hacking); explain possible consequences.

Society

- G9-12: 2.8 Design and implement a personal learning plan that includes the use of technology to support lifelong learning goals.
- G9-12: 2.9 Evaluate the authenticity, accuracy, appropriateness, and bias of electronic resources, including Web sites.
- G9-12: 2.10 Analyze the values and points of view that are presented in media messages.
- G9-12: 2.11 Describe devices, applications, and operating system features that offer accessibility for people with disabilities.

Research

- G9-12: 3.1 Devise and demonstrate strategies for efficiently collecting and organizing information from electronic sources.
- G9-12: 3.2 Compare, evaluate, and select appropriate electronic resources to locate specific information.
- G9-12: 3.3 Select the most appropriate search engines and directories for specific research tasks.
- G9-12: 3.4 Search for information within an electronic source (e.g., using the find command).

Problem Solving

- G9-12: 3.5 Explain and demonstrate how specialized technology tools can be used for problem solving, decision making, and creativity in all subject areas (e.g., simulation software, environmental probes, computer-aided design, geographic information

systems, dynamic geometric software, graphing calculators, art and music composition software).

Communication

- G9-12: 3.6 Use a variety of media to present information for specific purposes (e.g., reports, research papers, presentations, newsletters, Web sites, podcasts, blogs), citing sources.
- G9-12: 3.7 Demonstrate how the use of various techniques and effects (e.g., editing, music, color, rhetorical devices) can be used to convey meaning in media.
- G9-12: 3.8 Use online communication tools to collaborate with peers, community members, and field experts as appropriate (e.g., bulletin boards, discussion forums, listservs, Web conferencing).
- G9-12: 3.9 Plan and implement a collaborative project with students in other classrooms and schools using telecommunications tools (e.g., e-mail, discussion forums, groupware, interactive Web sites, videoconferencing).

School-to-Career Skills Reflected in the Course Competencies
(*Reflect SCANS Skills—The Secretary's Commission on Achieving Necessary Skills)

- Oral and written communication*
- Listening effectively*
- Computer literacy/applications*
- Decision making*
- Creative thinking*
- Critical thinking
- Problem solving*
- Time management*
- Organizing*
- Teamwork
- Transfer learning strategies*
- Math skills/Manage money*
- Self-Management*
- Visioning an end result*
- Understand systems*
- Apply information to problems and tasks*
- Analyze/interpret information and tasks*
- Preparation for internships, education after high school, and employment

AHS School-Wide Academic Expectations Reflected in the Course Competencies

- Students will demonstrate satisfactory achievement in the standards-based curriculum at Agawam High School
- Students will communicate effectively through listening
- Students will communicate effectively through reading

- Students will communicate effectively through speaking
- Students will communicate effectively through writing
- Students will use scientific and mathematical processes to interpret and evaluate information and solve problems across the curriculum
- Students will develop proficiency in information and communication technology literacy skills and will use appropriate tools to identify and solve problems across the curriculum
- Students will participate in activities to foster individual interests and fulfill individual potential
- Students will explore/study visual, practical, and performing arts and their applications
- Students will become knowledgeable of the changing employment market and acquire skills for career exploration

Massachusetts Common Core of Learning Elements Reflected in the Course Competencies

- Read, write, and communicate effectively
- Use mathematics, the arts, computers, and other technologies effectively
- Define, analyze, and solve complex problems
- Acquire, integrate, and applying essential knowledge
- Study and work effectively
- Demonstrate personal, social, and civic responsibility

Computer Science Teachers Association (csta) Model Curriculum for K-12 Computer Science Reflected in the Course Competencies

Level II Objectives

Topic 2: Problem Solving

- Name and explain the steps in the problem-solving process
- Solve a problem by applying the problem-solving process

Topic 9: Ethical Issues

- Distinguish between ethical and legal issues
- Define intellectual property and state the impact of provisions to protect it
- Demonstrate behavior in the use of technology that conforms to school and local code

Topic 13: Multimedia

- Explain the differences, advantages and disadvantages between vector and bit-mapped images
- Based upon the file extension, determine if a given file type is audio, video, or an image and then select the correct tool for viewing the file
- State the difference between current image formats regarding accessibility and size
- Convert between image formats
- Display a multimedia project within a Web page or **document**

- Determine if a given multimedia object can legally be duplicated and/or distributed
- Research computer hardware necessary to support multimedia—sound cards, video and digital capture cards, digital cameras, scanners, web-cameras, digital video camcorders, processor speed, RAM
- Use a digital camera, microphone, web-cam, digital video camcorder, scanner, etc.
- Use a graphical editor to save the same image in several formats; evaluate the changes in file size and image quality; compress and uncompress objects
- Discuss the process by which sound and video become digitalized

Topic 14: Applications

- Select the appropriate application(s) to use for a particular project
- Use integrated software productively

National Educational Technology Standards (NETS, 2007) Reflected in the Course Competencies

Creativity and Innovation—Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology

- Apply existing knowledge to generate new ideas, products, or processes
- Create original works as a means of personal or group expression

Communication and Collaboration—Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others

- Interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media
- Communicate information and ideas effectively to multiple audiences using a variety of media and formats
- Contribute to project teams to produce original works or solve problems

Research and Information Fluency—Students apply digital tools to gather, evaluate, and use information

- Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media
- Evaluate and select information sources and digital tools based on the appropriateness to specific tasks
- Process data and report results

Critical Thinking, Problem Solving, and Decision Making—Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources

- Identify and define authentic problems and significant questions for investigation
- Plan and manage activities to develop a solution or complete a project
- Collect and analyze data to identify solutions and/or make informed decisions
- Use multiple processes and diverse prospective to explore alternative solutions

Digital Citizenship—Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior

- Advocate and practice safe, legal, and responsible use of information and technology

- Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity
- Exhibit leadership for digital citizenship

Technology Operations and Concepts—Students demonstrate a sound understanding of technology concepts, systems, and operations

- Understand and use technology systems
- Select and use applications effectively and productively
- Troubleshoot systems and applications
- Transfer current knowledge to learning of new technologies

Massachusetts Career/Vocational Technical Education Curriculum Frameworks Reflected in the Course Competencies

Information Technology Services Cluster

- **2.A Utilize multimedia and graphic tools.**
  - —Describe various interactive media tools.
  - —Create and manipulate illustrations using a drawing or painting program.
  - —Import and export graphics using external peripherals.
  - —Identify and define different graphic file formats.
  - —Open and run video clips.
  - —Create a simple video clip.
  - —Play and record sound clips.

Arts and Communication Services Cluster
Design and Visual Communication

- **2.E Describe and apply photographic principles.**
  - —Distinguish between digital and film photography.
  - —Explain differences among editorial, portrait, product and fine art photography.
  - —Identify and demonstrate the use of manual settings that control lighting (aperture, shutter speed etc.) versus automatic settings.
  - —Demonstrate different forms of image composition.
  - —Demonstrate lighting control (natural, supplemental and flash).
  - —Photograph a variety of subjects following the principles of photography, including portraits, landscapes, and still-life.
  - —Create a fine art/abstract composition following the principles of photography.
  - —Photograph an event for editorial publication keeping in mind the principles of photography.
  - —Demonstrate how to arrange a subject and photographer to frame elements.
  - —Prepare a contact sheet for client review.
  - —Identify methods of archiving images.
- **2.G Edit digital images using digital imaging software.**
  - —Demonstrate proficiency with photo editing tools, options and palettes.
  - —Retouch, modify, and correct images.
  - —Improve photo composition and focal points.
  - —Improve the color and tonal balance of an image.
  - —Demonstrate techniques of layer management.

—Define masks and channels and demonstrate techniques of using them in an image.
—Define raster file formats and their qualities.
—Integrate type into a digital image.
—Create a clipping path.
—Explain how to save an original file with layers for future editing.
—Prepare an image for offset printing.
—Optimize an image for publication on the web.
—Create an animation using layers.

- **2.L Apply principles of video production to produce a video project.**
  —Demonstrate camera preparation techniques.
  —Storyboard creative concept.
  —Plan footage using timing estimates.
  —Shoot video footage to storyboard concept.
  —Edit video footage using video editing software.
  —Optimize and save final edited footage in appropriate file formats.
  —Create a DVD with chapters for final project.
  —Create a DVD insert case using design and layout software.

National Standards for Business Education Performance Standards Reflected in the Course Competencies (2007)

Technological Communication

- Use CD-ROMs, DVDs, videos, and the Internet for knowledge acquisition
- Demonstrate video recording and editing abilities on DVD-R(W) and CD-R(W)
- Record, edit, and transfer MP3 files
- Create and edit with audio and video documents
- Discuss the limits and capabilities of storage media
- Select and apply multimedia software appropriate to specific tasks

Information Technology

- Describe the impact of technology on the knowledge and skills needed for success in the workplace
- Explain how information technology has contributed to work productivity and team work
- Analyze the potential societal effect of widespread reliance on information technology
- Analyze how developments in information technology affect the supply/demand characteristics of the job market
- Apply information technology skills to lifelong learning
- Describe interrelationships between hardware components and supportive software
- Use multimedia software to create projects to enhance academic achievement across the curriculum
- Identify and select appropriate multimedia file formats and properties (e.g., plug-ins)
- Create multimedia content and prepare it for delivery

- Troubleshoot multimedia software and projects
- Select and integrate multimedia software products appropriate for various computer platforms
- Identify and explain various types of online resources
- Access, navigate, and use online resources
- Use a wide variety of information technology resources to retrieve information
- Evaluate the credibility and bias of information sources
- Interpret information for use in decision making
- Cite sources of all types of data
- Evaluate the accuracy, relevance, and comprehensiveness of retrieved information
- Adhere to privacy, safety, and security policies and legislation (e.g., acceptable use policy, web page policies, student photo policies, computer crime, fraud, abuse)
- Explain the consequences of illegal and unethical use of information technologies (e.g., piracy, illegal downloading, licensing, infringement, inappropriate use of software, hardware, and mobile devices)
- Discuss copyright rules and regulations (e.g., images, music, video, software)
- Explain plagiarism and its consequences
- Demonstrate legal and ethical behaviors when using information technologies
- Demonstrate the appropriate use of intellectual property
- Discuss the impact of information technologies on all careers
- Identify positions and career paths in the field of information technology and explore careers in information technology
- Identify productivity software appropriate for specific tasks
- Select and apply the appropriate productivity software to complete tasks
- Design develop, and deliver advanced web content and applications using authoring tools