

Course of Study

Digital Media Arts Academy I and II

Warren County Career Center

**3525 North State Route 48
Lebanon, Ohio 45036**

Adopted June 29, 2009

*This document is for the use of the staff at Warren County Career Center.
Credit is given the designer of the template, Upper Valley JVS, Piqua, Ohio.*

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Acknowledgements

Digital Media Arts Academy I and II Warren County Career Center

We would like to take this opportunity to express our gratitude to the following people for their guidance and support in the preparation of this course of study:

Warren County Career Center Administrative Team
Warren County Educational Service Center
Kelly Shields
Mari Kay Miller
Brian Shoff

***Warren County Career Center
Resolution Of School Board Approval***

WHEREAS, representatives of Digital Media Arts Academy Program Department of the Warren County Career Center have reviewed the Course of Study; and

WHEREAS, this Course of Study is based upon Integrating Technical and Academic Competencies adopted by the State of Ohio for the Digital Media Arts Academy (DMAA) Program; and

WHEREAS, the Digital Media Arts Program has reviewed and added competencies as needed to address local labor market needs and trends in the industry;

NOW, THEREFORE, BE IT RESOLVED, in accordance with the Superintendent's recommendation, that the Warren County Career Center adopt the Digital Media Arts Academy I and II Course of Study.

District Superintendent

Date

President, Board of Education

Date

Statement of Recommendation

The Digital Media Arts Academy Program at Warren County Career Center has reviewed this course of study and recommends it for use as the foundation for instruction in the Digital Media Arts Academy class.

The developers of this course of study have considered local labor market needs and the school's ability to offer specialized programs. The competencies have been reviewed and accepted as being congruent with our school's vision, mission, and strategic goals. When appropriate, additional competencies related to the program area have been incorporated into this course of study.

Achievement of technical competencies, utilizing proper attitudes, and demonstrating appropriate values are critical for successful employment and for furthering educational opportunities within a student's chosen field. We believe that this course of study adequately and correctly focuses upon student development.

This course of study is recommended on: 06/29/2009

Warren County Career Center Vision Statement

WCCC is the valued partner of choice within the educational and economic systems of our communities, by providing quality academic and career technical education.

We pave the way for a future of opportunities unique to each of our learners.

Warren County Career Center Mission Statement

To prepare youths and adults to make informed career choices and to successfully enter, compete, and advance in a changing work world.

Warren County Career Values

- Treating each other with respect, dignity, trust and mutual value
- Communicating openly and honestly
- Taking ownership of personal actions and being held accountable for results
- Upholding and demonstrating high ethical, educational and fiscal standards
- Exhibiting high levels of professionalism
- Providing high quality instruction and highly qualified staff to ensure success for all learners
- Making quality customer service a high priority
- Promoting partnerships and a team environment
- Celebrating team and individual achievements
- Using data to drive planning, decision making and actions
- Embracing educational opportunities for change and diversity

Course Design

Courses are designed to reflect career-focused education, which combines high-level academics with real-life technical skills. The intent is to maximize a student's present and future academic and career success.

Career-focused education enhances the integration of academic and technical skills, designs programs that prepare students with transferable skills and promotes each student's career opportunities.

Course Philosophy

We believe that this curriculum guide will provide the instructor with curriculum objectives for the Digital Media Arts Academy (DMAA).

Course Goals

The course goals for Digital Media Arts Academy are to:

The goal for the Digital Media Arts Academy is to establish solid learning objectives for all students to be successful in the field. It is fully realized that the program will evolve with the professional input of the instructor and the changing nature of technology.

Course Description

Digital Media Arts Academy is a Career/Technical Program. It combines academic rigor with technical training. The Tech Prep concept includes two years of high school training, two years of technical college training, and two years of university training to earn a Bachelor's degree. Students benefit by building a career portfolio and gaining experience through internships and training while completing a Bachelor's degree in the same four years as non-Tech Prep students.

Students successfully completing the two-year Digital Media Art Academy Tech Prep program can earn articulated college credits from Sinclair. Qualifying students choosing to attend Sinclair earn a guaranteed \$3,000 scholarship through the Miami Valley Tech Prep Consortium. (<http://www.mvtechprep.org>)

Students can also earn articulated credit through the Greater Cincinnati Tech Prep consortium. These institutions offer credit through Cincinnati State, Miami University Hamilton and Middletown and University of Cincinnati College of Applied Science.

Tech prep programs have entrance requirements

I. Full Admission

To be eligible for full admission at the 11th grade to any pathway operated within Miami Valley Tech Prep Consortium, the student must meet all of the following prerequisites:

- Attain a minimum overall 2.0 grade point average (GPA) by no later than the end of the second semester of the 10th grade
- Complete algebra I, algebra I equivalent or a higher level math course with a grade of "C" or better by the end of the 10th grade
- Show evidence of no deficiencies in progress toward meeting high school graduation requirements

II. Provisional Admission

A. At the discretion of the secondary partner site/fiscal agent, a student may be admitted to a tech prep pathway at the 11th grade as a "Provisional Tech Prep" student under the following minimum conditions and requirements:

- The student is deficient in no more than two (2) of the admissions prerequisites in I.A.1.2.3. above and, when applicable, has met appropriate additional pathway-specific prerequisites listed in I.B.1. or 2. Above
- "Provisional" status applies only to the first year (i.e. 11th grade) of any pathway, and under no circumstances may it be extended beyond the close of the second semester of the 11th grade
- If, prior to the start of the 12th grade, the "Provisional" student has corrected all documented deficiencies, the student shall be placed on "Full Admission" status commencing with the first semester of the 12th grade.
- If, prior to the start of the 12th grade the "Provisional" student has not corrected all documented deficiencies, the student shall be removed from Tech Prep status
- 5. In choosing to offer "Provisional" status to incoming students at the 11th grade, the secondary partner site/fiscal agent agrees and shall have sole responsibility to assure the following:

a. The total number of 11th grade students admitted to all tech prep pathways on “Provisional” status at the secondary partner/fiscal agent site(s) in any academic year will not exceed 20% of the total number of 11th grade students admitted on “Full” status to all tech prep pathways at the secondary partner/fiscal agent site(s) within the same academic year.

Typical Class

45 minutes – 1 hour Students will research the topic in the classroom with teacher instruction or assistance.

10- 40 minutes Students will be able to apply skills learned in the Digital Media Arts Academy Program.

Internships and job-shadowing experiences will be available to students at local businesses.

Academic and Technical Integration

Expectations of curriculum must be aligned with what is written, taught, assessed, and reported. Student expectations focus on active, project-centered learning—an approach to learning that emphasizes a connection between ideas in a discipline and the outside world. Educational programming and course content will clearly connect career and post-secondary opportunities. At the Warren County Career Center, the main goal is to design courses and projects that use strategies for authentic instruction. These characteristics of instruction focus on deep understanding, established opportunities for concept connections, provide anticipatory and abstract thinking, and emphasize genuine application.

The academic courses at the WCCC follow the state model curricula. They are designed to meet both associate school and state requirements. These standards respond to the need to improve student achievement, quality of curriculum and instruction, and strengthen school and community relationships.

Technology

The Warren County Career Center board and staff believe that technology skills are essential for all students to achieve in the 21st century. It is the goal of this district to infuse technology into all facets of education:

- Instruction
- Assessment
- Administration
- Career planning
- Course design
- Professional development

Strategies to incorporate technology into all facets of education are a priority of the district and there is commitment to a continual process to provide updated hardware, software, and professional development for staff members for the purpose of providing a high quality education, with the integration of technology, for all students.

Job Shadowing

Job Shadowing is designed to give the student a short-term overview of the many opportunities within a career field. Career-technical instructors confer with students to determine appropriate experiences.

Internships and Job Placement vary somewhat, but during each experience students should accomplish the following goals:

1. Work with mentors, supervisors, co-workers, and others to accomplish assigned tasks that contribute to the long- and short-term goals of the student. All aspects of the internship/placement (including dates, times, responsibilities, evaluations, etc.) will be outlined in an approved Internship Learning Plan that is coordinated by the career-technical instructor.
2. Apply basic skills and knowledge to "real world" business settings and learn new skills that are relevant to the career path.
3. Demonstrate a solid understanding of the basic skills outlined in the Internship Learning Plan.
4. Reflect upon the internship/placement/job shadowing in terms of post-secondary education/career options.

The criterion for participation in career-based learning experiences is included in the approved packet for each activity and may be obtained by the instructor from the Career Pathways office.

The specifics of how these opportunities are offered in this career-technical program or statement of academic support are:

Students that meet the requirements set forth by the Early Placement Committee are eligible to work with local businesses during the second semester of their senior year. This allows the student to work during designated lab time with the approval of the Instructor. The Instructor will monitor academic eligibility along with the status of their field progress using contractor evaluations. In addition, parent approval and a written contract with the student for certain goals to be achieved will be required.

Students Served

The population served by this program is juniors and seniors.

Scope and Sequence

Unit Title: *Information Technology Basics*

Students will demonstrate knowledge of Information Technology basics.

Benchmark A: Demonstrate basic knowledge of information technology history

Indicators:

- Identify significant advances in the development of computer hardware and software
- Identify major milestones in the development of information technology
- Identify major individuals and their contributions to the information technology field
- Discuss the speed with which computer technology has evolved (i.e., evolution time line)

Benchmark B: Demonstrate basic knowledge of the information technology impact on society.

- Discuss how information technology impacts people and is used in business/industry/government and other institutions
- Discuss the impact of information technology on career pathways in business/industry (e.g., how computers have both eliminated and created jobs)
- Describe the psychological, physical, and health risks associated with information technology (e.g., Web addiction, carpal tunnel syndrome, gaming)
- Discuss possible security risks posed by the use of information technology and associated safeguards
- Discuss possible effects of natural disasters on business operations
- Discuss the evolution of international telecommunications standards and trends
- Discuss the impact of computers on access to information and information exchange worldwide
- Identify issues and trends affecting computers, information and personal privacy
- Identify ethical issues that have surfaced in the information age
- Explain how information technology affects the natural environment (e.g., disposal of equipment, energy use, use of natural resources)
- Discuss how IT innovation has impacted society and corporate efficiency (e.g., RFID, eServices)
- Discuss legislation that relates to information security (e.g., Gramm-Leach-Bliley, Sarbanes-Oxley, Patriot Act, DMCA, HIPAA)

Benchmark C: Demonstrate knowledge of information technology basics

Indicators

- Identify classifications of computing platforms
- Identify the elements of the information processing cycle (i.e., input, process,

output, and storage)

- Identify major hardware components and their functions
- Identify types of computer storage devices
- Identify types of processing (e.g., batch, interactive, event-driven)
- Identify major operating system fundamentals and components
- Identify the role of the binary system in information technology
- Explain the role of number systems and internal data representation in information technology
- Access needed information using company and manufacturers' references (e.g., procedural manuals, documentation, standards, work flowcharts, Internet/Intranet resources)
- Discuss the need for asset management (e.g., hardware, software licensing)
- Differentiate between asset tracking and asset management

Benchmark D: Demonstrate knowledge of software associated with information technology.

Indicators:

- Describe the key functions of systems software
- Classify widely used software applications (e.g., word processing, database management, spreadsheet development)
- Describe the range of languages used in software development
- Explain relationship between data and software development (e.g., basic data structures, XML, relational databases)
- Identify new and emerging classes of software
- Explain intellectual property (e.g., software, images, open-source, documentation)
- Explain the historical difference between packaged software and custom/in house developed software

Benchmark E: Demonstrate knowledge of software associated with information Technology

Indicators:

- Describe the key functions of systems software
- Classify widely used software applications (e.g., word processing, database management, spreadsheet development)
- Describe the range of languages used in software development
- Explain relationship between data and software development (e.g., basic data structures, XML, relational databases)
- Identify new and emerging classes of software
- Explain intellectual property (e.g., software, images, open-source, documentation)
- Explain the historical difference between packaged software and custom/in house developed software

Benchmark F: Explore the future of information technologies

Indicators:

- Identify new technologies relevant to information technology
- Discuss the future impact of information technology on business operations (i.e., productivity, global competitiveness)

- Examine the importance of new technologies to future developments and to the future knowledge of worker productivity
- Identify new and emerging drivers and inhibitors of information technology change

Benchmark G: Create documents using word processing software

Indicators:

- Create documents and tables
- Format text using basic and advanced formatting functions
- Locate/replace text using search and replace functions
- Create new forms, style sheets, and templates
- Employ word processing utility tools (e.g., spell checker, grammar checker, and thesaurus)
- Create tables, columns, outlines, footnotes and endnotes
- Create and run macros
- Assemble documents using merge functions (e.g., merge address files with letters and envelopes)
- Print materials using print functions
- Edit documents (i.e., version control)
- Access needed information using word processing help screens

Benchmark H: Create relational databases

Indicators:

- Create a database table
- Edit fields and records
- Modify the design of a database table
- Sort and retrieve data
- Perform single- and multiple-table queries (e.g., create, run, save)
- Create calculated fields
- Generate customized reports for database files
- Process data using database functions (e.g., structure, format, attributes, relationships, and keys)
- Locate/replace data using search and replace functions
- Sort data using multiple-field sorts
- Add/remove filters
- Create multiple criteria expressions
- Create adjoined files and subforms
- Create graphs and reports
- Print forms, reports, and results of queries
- Identify the relationship between database components
- Design a database to meet the needs of an actual situation or business problem
- Evaluate database design and functionality

Benchmark I: Create spreadsheets

Indicators:

- Design a spreadsheet in accordance with written and/or oral specifications
- Retrieve existing spreadsheets
- Format spreadsheets using basic formatting functions (e.g., page setup)

- Perform calculations using simple formulas
- Edit spreadsheets (i.e., delete, move, and copy within spreadsheets)
- Create charts and graphs from spreadsheets
- Group worksheets
- Input/process data using spreadsheet functions
- Improve spreadsheet display using enhancement features
- Protect data using spreadsheet protection features
- Run macros
- Troubleshoot spreadsheet problems
- Resolve function errors as needed
- Apply advanced spreadsheet formulas
- Create spreadsheet solutions to business problems
- Make "what if" business decisions using spreadsheets as a tool
- Save and print spreadsheets
- Access needed information using online help features

Benchmark J: Create presentations using presentation graphics

Indicators:

- Identify hardware items that support presentation software
- Compare/contrast various presentation software packages
- Create computer presentation and handouts in accordance with basic principles of graphic design and visual communication
- Edit presentations Copy from one presentation to another
- Insert clip art in a slide
- Create WordArt objects
- Create/modify a graph on a slide
- Add/delete a template to a presentation
- Create graphics documents using drawing and painting software programs
- Add transitions to slide shows
- Run slide shows manually and automatically
- Save slide show presentations

Benchmark K: Apply computer office tools

- Analyze problems requiring solutions involving the integration of computer applications
- Select appropriate productivity tool for solving specific problem
- Select source application and destination application
- Move/copy information between integrated applications
- Link objects between applications
- Embed information in applications

Benchmark L: Demonstrate knowledge of basic data communications components and Trends

Indicators:

- Identify key communications procedures
- Identify the hardware associated with telecommunications functions

- Identify the uses of data communication equipment
- Identify types of communications media
- Identify data transmission codes and protocols
- Distinguish between local area networks, wide-area networks, and other networks (e.g., wireless)
- Identify data communication trends
- Identify major current issues in data communications
- Identify security issues

Benchmark M: Evaluate and access information using electronic sources

Indicators:

- Explain how to conduct searches using electronic sources (e.g., selection of search terms)
- Access information using telecommunications software
- Access information using teleconferencing/video conferencing techniques
- Access information using portable or virtual storage technology
- List the uses of simulation/modeling as an information source
- Evaluate the quality and usability of electronic information
- Download information

Benchmark N: Install/configure software programs

Indicators:

- Identify hardware requirements (e.g., processor, memory, disk space, communications, printers, monitors)
- Determine compatibility of hardware and software
- Install given application/system software on various platforms in accordance with manufacturer's and business procedures
- Access manufacturers' technical support resources.
- Disable/uninstall software that may interfere with installation of new software
- Verify compliance to licensing agreement
- Differentiate between procedures for an upgrade and for a new installation
- Differentiate between stand-alone and network installation procedures
- Select appropriate installation options (e.g., default, customized)
- Configure software to appropriate operating system settings
- Troubleshoot unexpected results
- Document step-by-step installation and configuration procedures
- Verify software installation and operation
- Convert data files if required
- Configure macros, tools, and packages to accomplish simple organizational and personal tasks
- Demonstrate backup, recovery, and restoration techniques

Benchmark O: Demonstrate basic knowledge of the Internet

Indicators:

- Identify the key characteristics of the Internet
- Discuss the ownership/administration of the Internet
- Trace the development of Internet technology

- Identify current issues related to the Internet
- Identify services and tools offered on the Internet
- Identify the specific strengths, weaknesses, and special features of available search engines
- Explain bookmarks and their functions
- Explain accepted Internet etiquette (i.e., netiquette)
- Identify current uses and applications of the Internet

Benchmark P: Access the Internet

Indicators:

- Connect to the Internet
- Test Internet connection
- Identify the components of Internet software
- Install Internet software
- Explore browser features
- Download software upgrades from the Internet
- Unpack files using compression software
- Demonstrate acute awareness of virus protection techniques
- Install/update firewalls and malware protection
- List uses of mobile devices to access the Internet

Benchmark Q: Utilize Internet services

Indicators:

- Access business and technical information using the Internet
- Select search engine(s) to use
- Select appropriate search procedures and approaches
- Locate information using search engine(s) and Boolean logic
- Navigate Web sites using software functions (e.g., forward, back, go to, bookmarks)
- Evaluate Internet resources (e.g., accuracy of information)
- Access library catalogs on the Internet
- Access commercial, government, and education resources
- Bookmark Web addresses (URLs)
- Download files from FTP archives
- Communicate via e-mail using the Internet
- Subscribe to mailing lists
- Recognize the value of special interest groups and forums (e.g., blogs)
- Retrieve online tools
- Download/convert Internet programming files
- Install/configure Web browser
- Explore the multimedia capabilities of the World Wide Web
- Evaluate plug-ins and helpers to the Web browser
- Explore collaboration tools
- Participate in online audio and video conferencing
- Archive files
- Compile a collection of business sites (e.g., finance and investment)
- Explore electronic commerce

Benchmark R: Demonstrate knowledge of Web page basics**Indicators:**

- Differentiate between a client and a server Explain the role of browsers in reading files on the World Wide Web (e.g., textonly, hypertext).
- Identify how different browsers affect the look of a Web page
- Compare/contrast the features and functions of software editors available for designing Web pages
- Explain how bandwidth affects data transmission and on-screen image
- Discuss the characteristics and uses of plug-ins
- Compare the advantages and disadvantages of running one's own server vs. using a server provider

Benchmark S: Install computer system (e.g., monitor, keyboard, disk drive, and printer).**Indicators:**

- Identify primary PC components and the functions of each
- Discuss how hardware components interact and how conflicts arise
- Access needed information using manufacturers' references (e.g., procedural manuals, documentation, standards, work flowcharts)
- Secure supplies and resources
- Respond to error messages and symptoms of hardware failure
- Install boards to support peripherals
- Connect peripherals to CPU
- Employ appropriate safety precautions when working with PCs
- Configure system
- Verify system operation
- Document system installation activities
- Backup system configuration
- Test all applications

Unit Title: Operating Systems**Benchmark A: Explain operating systems****Indicators:**

- Compare and contrast operating systems
- Differentiate between microcomputer, minicomputer, and mainframe operating systems including handheld devices (e.g., tablets, PDA, pocket PC)
- Describe the system utilities used for file management
- Analyze operating system interfaces

Benchmark B: Describe computer memory utilization**Indicators:**

- Differentiate among memory types for PCs, mainframes, minicomputers, and networks
- Differentiate among the functions of extended memory, expanded memory, and

cache memory

- Describe the role of the relationship between memory and software applications
- Describe memory management functions (e.g., contiguous allocation, paging, segmentation, virtual memory)
- Describe the role of physical memory and registers
- Describe the role of overlays, swapping, and partitions
- Describe the role of pages and segments
- Describe the role of free lists, layout, servers, interrupts and recovery from Failures

Benchmark C: Perform standard computer backup procedures

Indicators:

- Recognize the need for regular backup procedures
- Plan a backup process
- Install backup software
- Perform restore operation using backup software
- Run compression drive backup software and restore operation using compression drive backup software
- Identify and maintain uninterruptible battery backup equipment
- Install surge suppression protection
- Compare/contrast full, incremental and differential backups

Unit Title: Hardware Design, Operation, and Maintenance

Benchmark A: Identify common computing platforms

Indicators:

- Identify the basic features of standard microprocessors (e.g., Intel family, RISC, AMD)
- Identify standard memory types (e.g., RAM, ROM, DDRAM)
- Identify standard input/output devices (e.g., ISA, EISA, PCI, USB, drive controllers, SCSI, PCMCIA, firewire)
- Identify the basic features of standard operating systems (e.g., Windows Macintosh OS; Solaris, Linux, UNIX)
- Identify the basic features of standard workstations.

Benchmark B: Troubleshoot computer systems

Indicators:

- Test system using diagnostic tools/software
- Identify problems in the operating system and related hardware (NS, ISS, IM)
- Differentiate between hardware and software failure (NS, ISS, IM)
- Update flash memory (BIOS) [(NS)]
- Optimize hard drive
- Gather information on problem from user

Benchmark C: Explain wireless communications

Indicators:

- Compare and contrast various wireless protocols in common use
- Compare and contrast various characteristics of wireless signals (e.g., reflection, diffraction, scattering and fading)
- Differentiate medium access methods used by wireless
- Describe and define other wireless communication standards in use today as they apply to personal, corporate, and public use (e.g., Bluetooth)
- Describe appropriate applications of wireless technologies to specific communication scenarios

Unit Title Software Systems Management**Benchmark A: Evaluate application software packages****Indicators:**

- Compare/contrast ease of learning, use, and interfacing for different software packages
- Compare/contrast ease of technical support for different software packages
- Compare/contrast clarity of documentation for different software packages
- Compare/contrast licensing agreements for different software packages
- Evaluate appropriateness of software for specific projects
- Test the functionality of proposed software configuration

Unit Title: Digital Media Arts Appreciation

This unit will introduce and expand a students understanding of the correlation between Fine Arts and Digital Media Arts. Students will understand how the basic principles of art affect skills and knowledge that are vital to digital media competences.

Benchmark A: Students will demonstrate knowledge of design principles.**Indicators:**

- Apply the principles and elements of design and their relationship to each other.
- Identify the nature of color and color harmonies.
- Assess the impact of various color harmonies on basic composition.
- Assess how color affects the principles of line, value, shape and form

Benchmark B: Students will demonstrate design skills.**Indicators:**

- Apply elements of design. (e.g., line, shape, color)
- Apply principles of design (e.g., proportion, balance, harmony, rhythm, unity)
- Apply color theory.
- Develop thumbnail concepts.
- Develop rough and comprehensive layouts.
- Create symmetric and asymmetric designs.
- Describe digital color concepts.

Benchmark C: Students will demonstrate knowledge of available graphics software applications.

Indicators:

- Apply tones, hues, and values.
- Apply color for emotional impact.
- Contrast/compare vector and raster images.
- Identify industry accepted graphic file types (e.g., vector, raster, image)
- Identify graphic tools, menus, and functions, such as grouping, transformations and blending.
- Identify simple and advanced development tools, styles, templates, and automated tasks.
- Identify simple and advance techniques for manipulating object attributes and types.
- Select the most effective graphics applications for the intended uses.

Benchmark D: Students will identify current copyright and usage laws.

Indicators:

- Identify applicable legal considerations including copyright infringement.
- Demonstrate an understanding of how to purchase outside services and create property in accordance with current usage practices in purchasing outside services.
- Demonstrate knowledge of stock/photography and royalty free, Internet, and print.

Benchmark E: Students will construct digital graphics.

Indicators:

- Identify audience and purpose of graphics.
- Select the appropriate style of graphics based on the intended purpose.
- Create graphics that integrate principles of communication and elements of visual design.

Benchmark F: Students will demonstrate a knowledge and an appreciation for music.

Indicators:

- Assess the role of music in contemporary living.
- Distinguish the basic physical properties of sound (e.g. pitch, intensity, duration, and timbre)
- Distinguish the various elements of music (e.g. rhythm, melody, harmony, tone, color, and form)
- Identify how musical elements relate to the meaning or content of a composition.
- Identify the feelings conveyed by various musical elements (e.g., thematic construction, tonal color, instruments, texture, volume, and tempo)
- Discuss how music visualization is used to evoke a specific emotional response.

Benchmark G: Students will demonstrate knowledge of and an appreciation for the visual arts.

Indicators:

- Define various forms of visual art.
- Define the various elements of visual arts. (e.g. lines, colors, light and dark, texture, volume, perspective)
- Identify the feelings conveyed by various elements of visual arts.
- Discuss how music and visual can evoke a specific emotional response.

Benchmark H: Students will construct digital graphics.

Indicators:

- Identify audience and purpose of graphics.
- Select the appropriate style of graphics based on the intended purpose.
- Create graphics that integrate principles of communication and elements of visual design.

Unit Title: Graphic Design Fundamentals

Benchmark A: Demonstrate basic knowledge of technical art skills (traditional and electronic)

Indicators:

- Demonstrate the ability to center, space, and scale drawings
- Identify various types of drawing media and a variety of surfaces
- Identify various examples of mechanical drawing equipment
- Interpret information from drawings, prints, and sketches
- Draw freehand sketches
- Alter drawings
- Create charts, graphs, and diagrams
- Evaluate drawings

Unit Title: Photography

Benchmark A: Develop competency in the use of photographic equipment

Indicators:

- Differentiate between various formats (i.e., traditional vs. digital)
- Select appropriate camera format for given situation
- Demonstrate knowledge of apertures
- Identify appropriate depth of field
- Employ appropriate shutter speeds
- Employ appropriate shutter speed for desired exposure effects
- Use shutter speed to stop and show motion
- Calculate equivalent exposures
- Identify desired exposure using a light meter
- Provide needed lighting conditions using electronic flash units
- Create photographs using varied lighting and formats
- Create photographs using different lenses (e.g., wide-angle, telephoto, zoom)
- Identify appropriate light sources
- Create photographs using various lens filters (e.g., color-compensating, polarizing, special effects, black-and-white contrast control)

Benchmark B: Demonstrate knowledge of photographic terminology

Indicators:

- Discuss the role played by the following photographic elements: composition, formal qualities, scale, use of space, use of light
- Discuss how the meaning of a photograph is affected by composition, formal qualities, scale, use of space, and use of light
- Identify the use and meaning of symbolism in given photographs
- Identify the use and meaning of metaphor in given photographs

Unit Title: Visual Media Design

Students will develop skills and knowledge relating to various forms of digital visual media design. These include 2-D and 3-D animation and the art skills required to perform at an advanced level.

Benchmark A: Create visual design guidelines.

Indicators:

- Consider the relationship between form and content.
- Create a multi-layered image.
- Select appropriate colors for the design.
- Define color-editing capabilities.
- Identify appropriateness of 3-D elements.
- Integrate human factors and user interface in visual design.
- Evaluate visual appeal of design.
- Construct model. (i.e., physical or computer-based)
- Evaluate model against guidelines.

Benchmark B: Demonstrate proficiency in the use of digital imaging techniques and equipment.

Indicators:

- Identify standard hardware platform components and configurations.
- Identify memory and storage requirements.
- Identify computer architecture requirements for digital imaging.
- Explain how a digital image is generated.
- Identify types of digital imaging software.
- Operate digital imaging equipment (e.g., scanner, digital camera, video input devices, graphics tablet, graphics expansion board, printer, film recorder, and output devices).
- Compare/contrast area and linear arrays.
- Compare/contrast exposure and multi-exposure systems.
- Compare/contrast layering techniques.
- Select appropriate resolution.
- Perform resolution calculations (e.g., number of pixels, number of colors).
- Compare/contrast addressable and displayable resolution.
- Archive and manage images

Benchmark C: Demonstrate knowledge of the principles of 3-D modeling

Indicators:

- Explain how to convert objects from two-dimensional to three-dimensional.

- Explain how a computer deals with geometry (e.g., algorithms, vectors)
- Identify the software available for 3-D modeling
- Explain the steps for building a 3-D model.
- Define the components of a wireframe model.

Benchmark D: Create 3-D models.

Indicators:

- Create a model using 3-D modeling software.
- Determine desired camera angle.
- Adjust lighting angle, focus, and color to achieve desired effect.
- Adjust surface color, texture, transparency, and reflectivity to achieve desired effect.
- Compare/contrast flat shading, curved shading, ray tracing, and radiosity methods.
- Render the object using flat shading.
- Render the object using curved shading.
- Render the object using ray tracing.
- Combine models to create a scene.
- Render the completed scene.

Benchmark E: Perform advanced 3-D image generation techniques.

Indicators:

- Follow basic animation principles
- Perform basic texture-mapping algorithms.
- Perform basic antialiasing.
- Perform basic volume-rendering algorithms.
- Develop basic curves and surfaces.
- Perform surface detail modeling.

Benchmark F: Utilize the basic principles of 2-D animation.

Indicators:

- Explain the principles of continuity, key frames, motion paths, and motion (e.g., shape tweening, path tweening, motion tweening)
- Create special effects and virtual navigation.
- Identify available animation software programs/tools.
- Create 2-D sprite animation.
- Discuss the principles of cell animation.
- Explain timelines, key frames, and objects in animation.

Benchmark G: Utilize the basic principles of 3-D animation.

Indicators:

- Create pre-rendered 3-D animation.
- Create real-time Virtual Reality Mark-up Language (VRML) 3-D animation.

Benchmark H: Develop animated characters.

Indicators:

- Design a character based on a narrative context.
- Develop characters in accordance with designs.

- Animate a character so as to express its nature.
- Capture motion.
- Design 2-D characters.
- Design 3-D models of characters.

Benchmark I: Create 3-D environments.

Indicators:

- Create buildings and rooms.
- Import buildings and rooms.
- Create land forms.
- Import land forms.
- Create bodies of water (e.g. lakes, rivers, oceans, waterfalls)
- Create basic water textures, reflections, refractions, and splashing.
- Incorporate fog and background images.
- Manipulate particle systems such as rain and snow.
- Apply lighting effects.
- Add special effects.
- Code object intelligence into a 3-D environment.

Benchmark J: Demonstrate knowledge of virtual environment.

Indicators:

- Explain the basic principles of virtual environment.
- Explain the principles of geometry relative to virtual environment.
- Differentiate virtual environment file formats (e.g., QTVR, IPIX)
- Manage polygon resources.
- Create a basic virtual environment.

***Unit Title: Multimedia Development:
 Performance Testing and Quality Assurance***

Benchmark A: Develop and perform usability and testing integration

Indicators:

- Provide individuals from the representative user community opportunities to interact with product
- Observe and document user while using the product
- Convey information of usability test to development team/ or have development team attend usability testing sessions
- Resolve any problems that are indicated from usability test results
- Maintain test data and documentation over time for accessibility to the development team
- Describe test routines and procedures for applicability efficiency
- Identify appropriate metrics for the tests based on user task analysis findings
- Repeat usability testing as necessary after product revisions

Benchmark B: Complete performance test process

Indicators:

- Identify appropriate team members in test process
- Test system according to plan and schedule
- Document test results and communicate as appropriate
- Perform system integration testing and volume/performance testing when appropriate
- Repeat testing after all major program modifications

Unit Title: Storyboarding

Storyboarding is a skill that is very important for beginning directors. It is a critical skill in creating animation sequences, and is important to the multimedia developer in planning the needs of a project. Students apply storyboarding techniques to their own script by accurately showing camera angles, placement of the actors, etc. Emphasis is placed on accuracy and presentation.

Benchmark A: Develop storyboards to communicate ideas and develop projects.**Indicators:**

- Make preliminary thume and kims showing placement of images and text on screen.
- Develop storyboards showing placement of buttons/navigation, color schemes and lighting.

Benchmark B: Write scripts that have appropriate detail and effective communication in relation to project goals.**Indicators:**

- Determine uses and need for scripts, storyboards and flow charts.
- Describe music to be used in project.
- Describe video (still and motion).
- Describe special effects (video and audio).
- Write narration and actor lines.
- Describe scenes.

Unit Title: Interactive Multimedia Production**Benchmark A: Demonstrate knowledge of interactive media****Indicators:**

- Define interactive media components
- Identify the major characteristics of interactive media presentations
- Identify the important historical developments leading to contemporary interactive media
- Identify various interactive media industry genres
- Perform critical review of various interactive media end products
- Identify rights, responsibilities, and controls related to various interactive media
- Interpret intellectual property laws relative to interactive media
- Analyze the social and cultural implications of interactive media

- Identify key criticisms of interactive media
- Identify possible applications for interactive media (e.g., sales and marketing, interactive advertising, K-12 education, corporate training, corporate communications, distance learning, news, entertainment)
- Identify specific uses of interactive media in each potential market
- Identify future trends in interactive media

Benchmark B: Produce interactive media as a member of a development team

Indicators:

- Define the role of individual team members
- Develop a conceptual model for the interactive media project
- Select appropriate hardware tools
- Select appropriate software tools
- Select the media elements (e.g., sound, video, graphics, text, animation) to be used
- Integrate media elements
- Select the publication process to be used
- Select the distribution method to be used
- Explain decisions made (e.g., inputs and outputs)

Benchmark C: Develop project concept proposal

Indicators:

- Determine purpose of the interactive media project
- Determine client needs and expected outcomes
- Determine the target audience
- Determine objectives
- Research the content
- Develop a design brief
- Select appropriate message design (e.g., instructional, informational, entertainment)
- Determine the setting where the message will be used
- Determine the interactive media elements to be used
- Determine degree of interactivity desired
- Identify available media and content sources
- Decide whether to produce or acquire content (graphics, animation, audio, video, simulations, virtual environments, copyrights)
- Develop time line, task breakdown, and responsibilities for completion
- Develop project budget
- Write proposal
- Obtain client approval throughout project

Benchmark D: Develop navigational structures

Indicators:

- Identify types of navigational menu structures (e.g., rollovers, drop-downs, disjointed)
- Determine placement of navigational units
- Construct and place navigational units

- Developing logic/site maps

Benchmark E: Develop scripts, storyboards and flowcharts used in interactive media

Indicators:

- Determine uses and need for scripts, storyboards and flow charts
- Make preliminary sketches showing placement of images and text on screen
- Show placement of buttons/navigational graphics
- Provide information on color schemes
- Describe music to be used
- Describe video (still and motion)
- Describe special effects (video and audio)
- Provide a sample layout

Benchmark F: Combine media elements to produce an interactive multimedia project

Indicators:

- Apply visual design skills
- Generate text for multi-image presentations (e.g., title graphics, charts, graphs)
- Create 2-D computer graphics
- Create 3-D computer graphics
- Create computer animation
- Prepare photographic images for interactive media
- Alter images using an image manipulation program
- Integrate photographically derived images with hand-drawn graphic images
- Integrate the use of photographic special effects into interactive media presentations
- Acquire talent, if necessary
- Coordinate work with the acquired talent
- Create/acquire video footage
- Digitize/edit video footage using computer video-editing software
- Record/acquire sound track, including narration, voice-overs, sound effects, and music
- Integrate sound with visuals
- Build in hotspots and interactive links
- Synthesize available interactive media technologies into a unified presentation/product using software and hardware tools
- Test product
- Debug product
- Maintain/update product

Benchmark G: Explain the types and uses of interactive media applications

Indicators:

- Describe an interactive media presentation (e.g., Web-based, local)
- Define *kiosks* and their uses
- Define video conferences and their uses
- Identify the characteristics of gaming and simulations

- Analyze interactive communities (e.g., gaming, interpersonal, auctions, support groups) and their functions in society
- Define mobile applications and their uses
- Identify emerging applications and their uses

Benchmark H: Demonstrate knowledge of developing a training product

Indicators:

- Differentiate between training needs and development needs (
- Identify the major characteristics of learner audiences (adults, adolescents, etc.)
- Identify methods of product delivery (e.g., Internet, CD-ROM, Audio/Video)

Benchmark I: Develop a training product

Indicators:

- Analyze the audience
- Identify learner needs
- Develop training objectives
- Employ sound instructional design principles
- Employ a variety of media in presenting training
- Evaluate training effectiveness

Benchmark J: Maintain interactive media equipment

Indicators:

- Demonstrate proper care and handling procedures for interactive media equipment
- Perform pre-and post-production routines for presentations
- Analyze equipment performance against industry standards
- Troubleshoot simple equipment problems

Benchmark K: Assess interactive media career opportunities

Indicators:

- Identify potential career areas in interactive media
- Identify education/training needs (e.g., degree, non-degree, certificates, and certification)
- Initiate portfolio

***Unit Title: Multimedia Development:
 Performance Testing and Quality Assurance***

Benchmark A: Develop and perform usability and testing integration

Indicators:

- Provide individuals from the representative user community opportunities to interact with product
- Observe and document user while using the product
- Convey information of usability test to development team/ or have development team attend usability testing sessions

- Resolve any problems that are indicated from usability test results
- Maintain test data and documentation over time for accessibility to the development team
- Describe test routines and procedures for applicability efficiency
- Identify appropriate metrics for the tests based on user task analysis findings
- Repeat usability testing as necessary after product revisions

Unit Title: Digital Video Production

Students will work in groups to plan, shoot and edit a variety of projects, alternating among the various positions on a video production crew. The goal of the unit is for each student to demonstrate knowledge in one or more areas of video production (directing, producing, lighting, camera, editing or sound) and foundational graphic art skills.

Benchmark A: Students will understand the multiple elements of the operation of video camera/camcorders.

Indicators:

- Set white balance for different lighting conditions (e.g. tungsten, daylight, backlight)
- Practice camera movements (e.g. panning, zooming, tilting) using a tripod and handheld camera.
- Practice manual iris and focus.
- Playback recording on monitor.
- Identify the effect on a video camera of changing the setting in low light levels.
- Describe how a camera converts light to an electronic signal (e.g., CCD, CMOS, single vs. multi-chip, optics, A-D converter)

Benchmark B: Students will develop interact media teams.

Indicators:

- Define the role of individual team members.
- Develop a conceptual model of the interactive media project.
- Select the distribution method to meet the project goal

Benchmark C: Students will perform technical support tasks for a video production.

Indicators:

- Formulate strategies to properly utilize grip equipment during video production.
- Create solutions to unique shooting problems.
- Organize pre- and post-production routines.
- Analyze production requirements to determine grip equipments needs.
- Create required effects for lighting set-ups.
- Demonstrate safe work habits.
- Work as a member of a video production team.

Benchmark D: Develop project concept proposal.

Indicators:

- Identify the client needs and expectations.

- Determine the purpose of the interactive media project.
- Determine target audience.
- Research content.
- Develop a design brief.
- Select appropriate message design (e.g., instructional, informational, entertainment).
- Determine the setting where the message will be used.
- Determine the interactive media elements to be used.
- Determine degree of interactivity desired.
- Identify available media and content sources.
- Decide whether to produce or acquire content (i.e., graphics, animation, audio, video, simulations, and virtual environments).
- Develop time line for completion.
- Develop project budget.
- Obtain contract approval.
- Write proposal.

Benchmark E: Students will be able to combine media elements to produce an interactive multimedia project.

Indicators:

- Apply visual design skills.
- Acquire talent (i.e., actors, models)
- Coordinate work with the acquired talent
- Create video footage
- Digitize/edit video footage using computer video-editing software
- Record sound track, including narration, voice-overs, sound effects, and music
- Integrate sound with visuals
- Build in hotspots and interactive links
- Synthesize available interactive media technologies into a unified presentation using appropriate authoring software

Benchmark F: Students will demonstrate knowledge of developing a training product.

Indicators:

- Differentiate between training needs and development needs.
- Identify the major characteristics of learner audiences (adults, adolescents, etc.).
- Identify methods of product delivery (e.g., Internet, CD-ROM, Audio/Video).

Benchmark G: Students will develop an authentic training product.

Indicators:

- Analyze the audience.
- Identify learner needs.
- Develop training objectives.
- Employ sound instructional design principles.
- Employ a variety of media in presenting training.
- Evaluate training effectiveness.

Benchmark H: Identify technical support tasks of video production.

Indicators:

- Identify steps needed to acquire talent.
- Identify needed equipment and props.
- Identify potential locations for shooting.
- Identify scheduling needs.
- Describe music to be used.
- Describe video (still and motion).
- Describe special effects (video and audio).
- Describe scenes.
- Identify tasks required to price production needs.

Benchmark I: Interpret the relationship between the creative and craft skills.

Indicators:

- Identify the working relationships that exist between the various participants involved in the video production process.
- Discuss the relationship of the specific technical processes used by the camera, grip, lighting, sound, art, costume, special effects, make up, and editing departments.
- Analyze a script to identify technical requirements.
- Compare/contrast the techniques used in film and video production in studio and field.

Benchmark J: Perform camera-related tasks for video production.

Indicators:

- Analyze the aesthetic needs of a shot and accomplish them.
- Organize the proper care and handling of camera and camera assist equipment.
- Analyze the script for camera lens and shot requirements.
- Organize pre and post-production routines for camera operation.
- Analyze production requirements to determine camera equipment needs.

Benchmark K: Perform different types of lighting techniques.

Indicators:

- Identify different types of lighting fixtures.
- Identify parts of lighting fixtures and the function of each.
- Identify various applications of stage lighting equipment.
- Describe functions of master lighting panel and dimmer board.
- Analyze/document lighting requirements for production.
- Design a standard lighting plot.
- Set up appropriate lighting for a production.
- Operate master lighting panel and dimmer board in accordance with specifications.
- Appraise maintenance needs for lighting equipment.
- Design special effects lighting.

Benchmark L: Design scenery for a video production.

Indicators:

- Design scenic plans to scale.
- Interpret scenic plans to determine the materials and hardware need for scenic construction.

- Formulate design strategies for the construction of scenery.
- Create special effects scenery.
- Select stage props.
- Organize transportation of scenery to remote locations.
- Inspect/repair scenery as needed.

Unit Title: Digital Video Editing

This unit will address the basics of editing techniques and aesthetics. Students will develop their ability to analyze, cut and reassemble scenes based on camera angle, sound and flow.

Using software, students explore each step of the non-linear editing process, including logging and organizing footage, basic editing techniques, trimming, title keying, motion effects, audio mixing, media file management and exporting digital file formats.

Benchmark A: Students will demonstrate and perform editing operations.

Indicators:

- Identify operational components of video editing systems.
- Compare/contrast linear and nonlinear editing systems.
- Edit digital video, including transitions (e.g., dissolves, wipes, cuts), special effects, and computerized backgrounds.
- Employ the batch capture process.
- Add sound track.
- Add narration and/or voiceover.
- Interpret edit decision lists.
- Employ edit decision lists.
- Perform edits using timelines.

Benchmark B: Students will be able to identify video formats.

Indicators:

- Compare/contrast consumer, industrial, and broadcast-grade video cameras.
- Identify the characteristics of various camera formats (e.g., Beta cam, VHS, 8mm, super VHS, and DV-Cam)
- Identify image characteristics affected by camera choice.
- Compare/contrast technical aspects of NTSC, PAL, SECAM, HDTV video signals (scanning, frame rate, frame size, et.)
- Describe form synchronization and time-based correction.

Benchmark C: Students will import and export digital video.

Indicators:

- Describe the characteristics and uses of digitized video.
- Identify digital video bandwidths and their implications.
- Digitize analog video.
- Compress video files using various codes.

***Unit Title: Web Site Development:
Content Development and Technical Analysis***

Benchmark A: Gather data and identify customer requirements and scope of work

Indicators:

- Define audience and mission in accordance with client procedures
- Utilize affordable, reliable and relevant sources and methods for gathering requirements
- Specify requirements and scope of work assuring they are accurate, complete, documented, updated on a regular basis and stored in an accessible and readable knowledge base for future reference
- Gather information regarding global considerations (e.g., time zones, language, cultural sensitivities)

Benchmark B: Review technical information and restraints

Indicators:

- Consider technical factors (e.g., server load, screen resolution, hard drive space, bandwidth, database performance)
- Consider and address feasibility, usability, extensibility and maintenance issues
- Assess budget and equipment constraints and approvals
- Research and compare software tools as to their effectiveness for the work to be done and ability to integrate into the existing organization system
- Assess implementation risk and communicate to appropriate personnel
- Research and address system performance and availability requirements

Benchmark C: Develop, present, and assess concept alternatives

Indicators:

- Present an appropriate number of concepts to all relevant stakeholders
- Resolve conflicts among key stakeholders
- Present concept alternatives for developing an effective solution
- Consider and document technology alternatives
- Choose and document the appropriate solution
- Evaluate the alternatives against the selection criteria

Benchmark D: Prepare preliminary application

Indicators:

- Organize content information in order to meet application objectives (IM)
- Gather a consensus among all stakeholders regarding the organization of information and the look and feel of the product (IM)
- Follow company guidelines and practices in preparation of the preliminary application

Benchmark E: Prepare functional, content, testing and technical specifications

Indicators:

- Prepare functional, content, testing and technical specifications to include detail on all product features

- Present functional, content, testing and technical specifications in a clear and precise manner
- Publish and regularly update functional, content, testing and technical specifications
- Describe the operating system in functional, content, testing and technical specifications
- Integrate and analyze customer and end-user needs into technical specifications (IM)
- Describe software, communication protocols and programming languages in technical specifications

Benchmark F: Create and refine preliminary design or prototype

Indicators:

- Represent all required design features in a prototype
- Include representative functional features in a prototype
- Review and refine the prototype based on customer feedback, new information and technical considerations
- Evaluate the effectiveness of the software tools chosen for the project in the prototype
- Complete prototype on schedule

Benchmark G: Develop project plan

Indicators:

- Identify key stakeholder requirements in the project plan
- Include project schedules, resource allocations, dependencies, milestones, functional and technical specifications, all data models, site maps, constraints and risks in the project plan
- Include thorough testing of the solution and presentation of testing results in the project plan
- Include all specifications in the project plan
- Determine how documentation will be conducted in the project plan
- Document and regularly update the project plan throughout the project life cycle in a previously determined format
- Distribute project plan according to company procedures

Unit Title: Web Page Design

Benchmark A: Demonstrate knowledge of usability and interface design

Indicators:

- Discuss ADA section 508 compliancy requirements
- Examine psychological and cultural implications

Benchmark B: Demonstrate knowledge of Web programming basics

Indicators:

- Compare and contrast standard Web programming languages (e.g., Perl, JavaScript, Action Scripting, ASP, PHP, XHTML)
- Compare and contrast standard Web markup languages (e.g., HTML, XML) [PSD]
- Demonstrate use of organizational design guidelines

- Differentiate between various versions of Web programming
- Identify authoring programs specifically designed for Internet programming production (e.g., Microsoft FrontPage, Macromedia Dreamweaver)
- Identify cross-platform issues (i.e., PC, MAC, UNIX, Linux)
- Identify new and emerging trends related to Web programming
- Identify security issues related to client-side processing
- Create and maintain a basic Web site

Benchmark C: Explain basic Web programming

Indicators:

- Identify the purpose of Web content delivery enablers (e.g., CGI, API, SSI)
- Discuss client-side processing and its advantages/disadvantages
- Identify standard scripting languages (e.g., JavaScript, Visual Basic Script, Action Scripting)
- Discuss the uses and advantages/disadvantages of various scripting languages
- Explain how to use a scripting language to program a site
- Identify Internet protocol governing bodies
- Explain how to use Internet communication protocols

Benchmark D: Apply knowledge of Web hosting

Indicators:

- Compare the advantages and disadvantages of running one's own server vs. using a server provider
- Identify hardware requirements for a server
- Identify server software options
- Demonstrate the process of ordering a domain name
- Evaluate hosting providers (e.g., size, legitimacy, security, bandwidth allocation)
- Explain how to assign a domain name to a DNS server
- Comply with TCP/IP (Transfer Control Protocol/Internet Protocol)
- Upload files to the server
- Publicize the site (e.g., optimize search engine placement)
- Collect/analyze usage statistics

Benchmark E: Create/maintain a static Web site

Indicators:

- Open up a workspace to create a new Internet programming document
- Create the basic Internet programming structure for a Web page using a text editor or Web development software
- Explain the advantages of creating short multiple Web pages rather than a single, long Web page
- Determine logical points to split information into multiple Web pages
- Build basic navigation based on hyperlinks
- Create a template file using a text editor
- Make appropriate changes to template file to create individual pages
- Insert nondisplayed comments into Internet programming files
- Display document within a Web browser

- Make text modifications using a text editor
- Place different level headings within document using appropriate Internet programming tags
- Insert paragraph breaks into the text of document using appropriate Internet programming tag
- Manipulate text cut and paste functions
- Insert a stylized footer at the bottom of a page
- Format text
- Create lists
- Add graphics/images
- Add animation

Benchmark F: Demonstrate how to format page layout

Indicators:

- Determine targeted devices to be served (e.g., desktop, PDA, tablets, cell phone)
- Explain Internet programming codes for formatting page layout (e.g., table, CSS)
- Create a solid color background
- Calculate the hexadecimal code for a color value
- Change the color of text and hypertext link items
- Create a textured background using a graphic file
- Create various types of hard rule lines for page dividers (e.g., different thicknesses and widths, with and without 3-D shading)
- Create a table with rows and columns of text in a gridded display
- Create a layout scheme integrating text and pictures
- Create an invisible table with side-by-side columns
- Create a table that has different colored cells
- Explain interface design
- Display interlaced images
- Organize information using frames

Benchmark G: Demonstrate how to add audio and video to a Web page

Indicators:

- Define the process of delivering audio and video signals in real time (streaming)
- Assess audio sweetening techniques for the Web
- Define appropriate CODECS used for Web design
- Embed audio and video to a Web page
- Establish network administration procedures for audio and video

Benchmark H: Demonstrate how to link documents

Indicators:

- Identify the function and structure of URLs (Uniform Resource Locators)
- Identify the significance of a file called index.html on a Web server
- Copy URLs from a Web browser to an Internet programming text document
- Demonstrate the use of anchors in Web pages
- Attach a hyperlink to graphics
- Create a hypertext link that will send an e-mail message

- Differentiate between client-side image mapping and server-side image mapping
- Create images with linkable hot spots

Unit Title: Audio Production

This unit will develop the student's understanding of the purpose and impact of sound in a production environment. Students will explore the techniques necessary to produce and edit sound for digital media. Students will also explore the basic fundamentals of sound theory, composition and engineering.

Benchmark A: Students will demonstrate knowledge of audio recording and sound reinforcement.

Indicators:

- Describe basic acoustic principles.
- Differentiate the functions between microphone designs.
- Diagram signal flow throughout the recording chain.
- Operate a mixing console/applications, including its input and output functions.
- Edit audio recordings.
- Compare and contrast the properties of analog and digital recording.
- Explain sound reinforcement techniques used for live programs.
- Describe the characteristics and applications of analog signal processing.
- Describe the characteristics and applications of digital signal processing.

Benchmark B: Students will demonstrate knowledge of audio production.

Indicators:

- Analyze current trends in electronic music.
- Describe MIDI.
- Describe how analog signals are digitized.
- Select music appropriate for a given application.
- Demonstrate digital sampling for compressing sound files.
- Describe methods of analog and digital editing.
- Explain digital audio bandwidths and their implications.

Benchmark C: Students will create a sound track.

Indicators:

- Evaluate performance needs.
- Evaluate technical resources.
- Analyze script information to identify sound requirements.
- Design sound score appropriate to production and post-production needs.
- Select sound material.
- Analyze talent requirements.
- Coordinate the work of performers.
- Determine microphone and speaker placement.
- Incorporate mechanical and electrical sound effects.
- Discuss audio-for-video recording devices.
- Set-up audio-for-video recording devices.

- Operate audio-for-video recording devices.
- Explain the time-code system for audio-video synchronization.
- Set up time-code systems for audio-video synchronization.
- Operate time-code systems for audio-video synchronization.
- Identify the parts of an audio mixing console/applications.
- Operate audio mixing console/applications.
- Create a MIDI sound score

Unit Title: Business Processes for IT Professionals

Benchmark A : Demonstrate knowledge of project planning methodology

Indicators:

- Define terms associated with project planning
- Identify steps associated with project planning
- Identify methodologies associated with project planning
- Define the project's contribution to business needs
- Identify stakeholders and decision makers
- Define the scope of the project
- Evaluate project requirements
- Develop task list (e.g., work breakdown structures)
- Prioritize tasks according to business needs
- Identify required resources and budget
- Develop initial project management flowchart
- Identify critical milestones
- Evaluate risks
- Prepare contingency plan
- Develop a method of evaluation
- Explain alternative development methodologies

Benchmark B: Identify current technical environment

Indicators:

- Identify current internal and external technical resources
- Identify current internal and external technology
- Identify internal and external processes

Benchmark C : Demonstrate knowledge of the testing environment

Indicators:

- Identify the purpose of integration testing
- Identify the purpose of system testing
- Identify the purpose of security testing
- Identify the purpose of acceptance testing

Benchmark D: Explain the value a communication plan can provide to implementation

Indicators:

- Identify communication vehicles
- Identify components of a communication plan
- Explain the importance of audience when developing a communication plan
- Describe types of communication channels (e.g., formal vs. informal)
- Define stakeholder relationships (e.g., customer, employers, shareholders, suppliers)

Unit Title: Business Law and Legal Issues

Benchmark A: Define intellectual property rights covered by intellectual law

Indicators:

- Distinguish among the various forms of intellectual property rights (e.g., copyright, patent, trademark, trade secrets)
- Define plagiarism
- Define authorship Define work made for hire
- Define fair use
- Differentiate the rights granted under copyright, patent, and trademark
- Identify the rights related to electronic imagery
- Discuss consequences of violation of copyright trademark and patent law
- Identify the liability for invasion of privacy
- Identify the liability for slander and libel Identify legal terms related to IT
- Discuss licensing issues
- Discuss confidentiality issues and their liability implications

Benchmark B: Describe the components of contracts

Indicators:

- Define statement of work
- Define duration
- Define liabilities
- Define termination clause Define service level agreements
- Define exclusions
- Define warranties
- Explain dispute resolution
- Define terms and conditions

Benchmark C: Identify current regulatory issues (e.g., HIPAA, Gramm-Leach-Bliley, Sarbanes-Oxley, NSA–National Security Act, Homeland Security)

Indicators:

- Explain the impact of regulatory compliance issues on the design and development process
- Define/explain the impact of non-compliance to the company/organization
- Explain risk of non-compliance to the company/organization

Unit Title: Professional Practices

Benchmark A: Identify legal and ethical behavior

Indicators:

- Differentiate between legal and ethical behavior
- Explain terms, principles, and characteristics of legal and ethical behavior (e.g., loyalty, discretion, solicitation, competitor, supplier)
- Explain legal ramifications of breaching rules and regulations
- Explain the effects and consequences of unethical and/or unlawful behavior

Benchmark B: Explain professional responsibilities

Indicators:

- Explain the need for professional and ethical standards
- Explain responsibility of the individual to apply ethical standards
- Identify responsibility to clients(s) and employer(s)
- Explain importance of conflict resolution in the workplace

Benchmark C: Explain the role of the IT professional in maintaining customer satisfaction

Indicators:

- Explain the nature of positive customer/client relations
- Describe the importance of all customers to the business
- Explain the importance of interaction with customers in a professional manner
- Explain the importance of maintaining customer base
- Determine appropriate communication vehicles (phone, e-mail, face-to-face)
- Differentiate internal vs. external customer service (cost of existing versus new)
- Discuss the role of company image
- Discuss the role of customer feedback in customer satisfaction
- Define function of call center
- Identify customer expectations

Benchmark D: Explain the importance of teams in achieving IT project goals

Indicators:

- Identify desired group and team behavior in an IT context
- Explain the importance of cross-functional teams in the IT environment
- Define roles/responsibilities within the group decision making process
- Identify ways to assess team productivity and results

Benchmark E: Explain the importance of professional behavior in the IT environment

Indicators:

- Identify appropriate resources for company policies affecting professional behavior (e.g., organizational policies, personnel handbooks, and manuals)
- Discuss how specific organizational policies and rules influence a specific work situation
- Explain the importance of self-discipline, positive attitude and integrity in a work situation (e.g., attendance, personal appearance) [
- Explain the importance of flexibility and willingness to earn new skills and

knowledge

Unit Title: Basic Business Concepts

Benchmark A: Explain business ownership

Indicators:

- Define types of business ownership (e.g., sole proprietorship, partnership)
- Explain the advantages and disadvantages of the different forms of business ownership
- Identify variations in ownership forms
- Explain how business organization ownership can evolve over time

Benchmark B: Explain basic business organization and structure

Indicators:

- Differentiate between divisional and departmental structures (e.g., customer, geographic and product)
- Identify types of organizational structures (e.g., organic, matrix, mechanistic)
- Explain how internal and external forces impact the requirements for tech or service implementation (e.g., size, complexity, profitability)

Benchmark C: Discuss the role of IT in meeting business strategic objectives

Indicators:

- Identify common sources outlining strategic business objectives
- Define typical business objectives
- Identify ways in which business objectives are measured (e.g., key performance indicators)
- Identify business stakeholders (e.g., shareholders, customers, suppliers)
- Discuss how IT functions impact business objectives
- Discuss obstacles in measuring the impact of IT functions on business objectives

Benchmark D: Discuss the role of IT in meeting business strategic objectives

Indicators:

- Identify common sources outlining strategic business objectives
- Define typical business objectives
- Identify ways in which business objectives are measured (e.g., key performance indicators)
- Identify business stakeholders (e.g., shareholders, customers, suppliers)
- Discuss how IT functions impact business objectives
- Discuss obstacles in measuring the impact of IT functions on business objectives

Benchmark E: Explain how IT functions interface with other business functions

Indicators:

- Explain the role of IT in the business organization

- Explain how IT interfaces with the human resource function
- Explain how IT interfaces with the finance and accounting functions
- Explain how IT interfaces with the production/manufacturing functions
- Explain how IT interfaces with the sales, marketing, and distribution functions

Benchmark F: Demonstrate knowledge of cost-benefit analysis

Indicators:

- Define cost and benefit analyses
- Differentiate between nonrecurring costs and recurring costs
- Identify major cost categories (e.g., hardware, software, communication services, training, interface conversion)
- Differentiate between tangible benefits and intangible benefits)
- Explain why intangible benefits are included in analyses
- Identify tools used to rank and compare alternative costs and benefits (e.g., Net Present Value, Return on Investment, Discounted Payback Period)
- Execute full cost-benefit analysis

Unit Title: Technical Writing and Documentation

Benchmark A: Evaluate technical writing requirements

Indicators:

- Define/prioritize communication needs
- Resolve conflicting requirements
- Specify project objectives
- Determine the size and specifics of the work to be completed
- Estimate time, materials, and capabilities needed to complete assignment
- Identify criteria for successful completion of project
- Evaluate strengths and weaknesses of completed project

Benchmark B: Write technical reports

Indicators:

- Determine audience
- Access needed information using standard references and sources
- Identify type of report needed
- Compile relevant data
- Organize data into charts and graphs
- Analyze data
- Draw conclusions from data analysis
- Outline report
- Draft report
- Edit report (e.g., check spelling, grammar, punctuation, sentence structure, accuracy of content)
- Review report with peers

Benchmark C: Conduct technical research

Indicators:

- Identify target audience
- Define research questions
- Determine priorities for the information that should be gathered
- Identify potential sources of information
- Target audience/user group as a key information source
- Identify subject matter experts
- Evaluate potential sources of information based on established criteria (e.g., affordability, relevance)
- Conduct interviews with selected human information sources
- Gather information from selected print and electronic sources
- Determine the accuracy and completeness of the information gathered

Benchmark D: Design technical documentation

Indicators:

- Define purpose of documentation
- Specify standards for documentation, including critical success criteria
- Identify delivery options Evaluate cost-effectiveness of each delivery option
- Select tools appropriate for task purpose
- Plan information flow
- Select writing style and tone appropriate for given documentation
- Determine level of detail needed
- Identify visuals appropriate for given documentation
- Provide feedback on design to development team/individual

Unit Title: Portfolio Design and Development

Students will develop and maintain a portfolio of knowledge and skills acquired as a result of participating in the DMA Academy. Portfolios will be used as a resume tool for potential employers and entry into post-secondary training.

Benchmark A: Students will develop and maintain a portfolio of skills and knowledge of digital media arts skills and knowledge.

Indicators:

- Select 10-15 examples of knowledge and skills relating to DMAA experiences. (e.g., video production, logo, storyboard, package design, digital illustration, figure illustration).
- Design arrangement of portfolio elements.
- Select portfolio size appropriate to presentation (e.g., portability, ease of handling).
- Assemble work in commercial portfolio style.
- Update portfolio regularly.

Benchmark B: Students will periodically make portfolio presentations demonstrating their continued progress in the DMA Academy.

Indicators:

- Select portfolio items relevant to employability skills.
- Prepare leave-behind samples.
- Modify resume to include information relevant to employers.
- Present portfolio regularly for critique.

Benchmark C: Students will identify employment and post-secondary training opportunities relating to current skills developed in the DMA Academy.

Indicators:

- Develop a network of potential employment leads and / or advisors
- Identify employers using various sources including the yellow pages, professional associations and trade journals, library reference materials
- Identify post-secondary training options through higher-ed representatives
- Identify advertised job openings using periodicals (e.g., local, regional, and national newspapers, professional journals and newsletters)

Benchmark D: Students will demonstrate the ability and knowledge of technical competencies that is required for a professional internship.

Indicators:

- Understand the process of career preparation, career exploration, reflection, and reevaluation.
- Using an interest inventory students will describe and compare traits, skills and characteristics required for three career choices.
- Using a comparison of individual and career traits, skills, and characteristics, tentatively resolve potential conflicts between personal characteristics and career choice areas.
- Given a job-shadowing packet identify an employer and a date to job shadow two different business occupations.
- Using the evaluations form the job-shadowing packet describe the impact of two job-shadowing activities on current career choices.
- Using a worker interview sheet interview three different workers in a career field of interest.
- Using a self-assessment identify five occupational skills developed through volunteer experiences, part-time employment, or cooperative education programs.
- Using a individual career plan review and revise career information from earlier plans and include two tentative decisions to be implemented after high school.
- Given direction on contents develop a career plan containing three formal documents that identify and describe your skills.
- Given decision-making situations, identify two alternatives for each scenario.
- Using resources in the guidance department identify steps to apply for and secure financial assistance for postsecondary education and training.

Technology Standards

Standard 1: Nature of Technology

Students develop an understanding of technology, its characteristics, scope, core concepts* and relationships between technologies and other fields.

Benchmark A: Synthesize information, evaluate and make decisions about technologies.

Benchmark B: Apply technological knowledge in decision-making.

Benchmark C: Examine the synergy between and among technologies and other fields of study when solving technological problems.

Standard 2: Technology and Society Interaction

Students recognize interactions among society, the environment and technology, and understand technology's relationship with history. Consideration of these concepts forms a foundation for engaging in responsible and ethical use of technology.

Benchmark A: Interpret and practice responsible citizenship relative to technology.

Benchmark B: Demonstrate the relationship among people, technology and the environment.

Benchmark C: Interpret and evaluate the influence of technology throughout history, and predict its impact on the future.

Benchmark D: Analyze ethical and legal technology issues and formulate solutions and strategies that foster responsible technology usage.

Benchmark E: Forecast the impact of technological products and systems.

Standard 3: Technology for Productivity Applications

Students learn the operations of technology through the usage of technology and productivity tools.

Benchmark A: Integrate conceptual knowledge of technology systems in determining practical applications for learning and technical problem-solving.

Benchmark B: Identify, select and apply appropriate technology tools and resources to produce creative works and to construct technology-enhanced models.

Standard 4: Technology and Communication Applications

Students use an array of technologies and apply design concepts to communicate with multiple audiences, acquire and disseminate information and enhance learning.

Benchmark A: Apply appropriate communication design principles in published and presented projects.

Benchmark B: Create, publish and present information, utilizing formats appropriate to the content and audience.

Benchmark C: Identify communication needs, select appropriate communication tools and design collaborative interactive projects and activities to communicate with others, incorporating emerging technologies.

Standard 5: Technology and Information Literacy

Students engage in information literacy strategies, use the Internet, technology tools and resources, and apply information-management skills to answer questions and expand knowledge.

Benchmark A: Determine and apply an evaluative process to all information sources chosen for a project.

Benchmark B: Apply a research process model to conduct research and meet information needs.

Benchmark C: Formulate advanced search strategies, demonstrating an understanding of the strengths and limitations of the Internet, and evaluate the quality and appropriate use of Internet resources.

Benchmark D: Evaluate choices of electronic resources and determine their strengths and limitations.

Standard 6: Design

Students apply a number of problem-solving strategies demonstrating the nature of design, the role of engineering and the role of assessment.

Benchmark A: Identify and produce a product or system using a design process, evaluate the final solution and communicate the findings.

Benchmark B: Recognize the role of teamwork in engineering design and of prototyping in the design process.

Benchmark C: Understand and apply research, development and experimentation to problem-solving.

Standard 7: Designed World

Students understand how the physical, informational and bio-related technological systems of the designed world are brought about by the design process. Critical to this will be students' understanding of their role in the designed world: its processes, products, standards, services, history, future, issues and career connections.

Benchmark A: Classify, demonstrate, examine, and appraise energy and power technologies.

Benchmark B: Classify, demonstrate, examine and appraise transportation technologies.

Benchmark C: Classify, demonstrate, examine and appraise manufacturing technologies.

Benchmark D: Classify, demonstrate, examine and appraise construction technologies.

Benchmark E: Classify, demonstrate, examine and appraise information and communication technologies

Benchmark F: Classify, demonstrate, examine and appraise medical technologies.

Benchmark G: Classify, demonstrate, examine and appraise agricultural and related biotechnologies.

Performance Measures/Student Assessment/Instructional Strategies

Assessments/Evaluations

- Observations
- Demonstrations
- Portfolios
- Standardized Tests
- Class Assignment
- Quizzes/Tests/Exams
- Web Exam/Certification

Instructional Strategies

- Teacher-Directed & Student-Centered Activities
- Case Study Problem Solving
- Cooperative Learning
- Project-Based Learning
- Career-Based Learning (Internships/Shadowing/Placement)
- Community-Based Learning (CTSOs and Other)
- Exploratory Learning
- Independent Research
- Team Teaching

Content Specific Strategies