

Fundamentals of Technology

Syllabus

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Course Number: 8169 (OHLAP Approved)
Pre-requisite: None
College Credit: Computer Science/Computer Technology Credit
Career Clusters: Information Technology

Objective: This course will provide students with the fundamental concepts, principles, and ideas needed to understand how business is operated and managed in a rapidly changing global environment, which is needed for success in business-related careers. This course also provides job readiness skills and soft skills that are critical for success in any workplace setting.

Upon successful completion of this course, the student will be able to:

Duty A: Identify Types of Computers, How They Process Information and How Individual Computers Interact With Other Computing Systems and Devices

- Categorize types of computers based on their size, power and purpose
- Identify types of microcomputers
- Identify other types of computing devices
- Identify the role of the central processing unit
- Identify how the speed of the microprocessor is measured
- Identify the role of types of memory and storage and the purpose of each, including RAM, ROM and CD ROMs
- Identify concepts related to how memory is measured, including bits, bytes and megabytes
- Identify the flow of information between storage devices (such as floppy or hard disks) to the microprocessor and RAM in relation to everyday computer operations
- Identify the differences between large systems and desktop computers and appropriate uses for large vs. small systems
- Identify that computers integrate into larger systems in a variety of ways
- Identify how computers share data, files, hardware and software

Duty B: Identify the Function of Computer Hardware Components

- Identify the types and purposes of external computer components, including standard input and output devices
- Identify the types and purposes of internal computer components
- Identify the types and purposes of specialized input devices (e.g. digital cameras and touch screens)

- Identify the types and purposes of specialized output devices (e.g. projectors)
- Identify the types and purposes of storage media (e.g. DVDs and network drives)
- Identify ports used to connect input and output devices to a computer (e.g. USB ports and Ethernet ports)
- Identify how hardware devices are installed on a computer system

Duty C: Identify the Factors That Go Into an Organizational Decision on How to Purchase Computer Equipment

- Identify criteria for selecting a personal computer
- Identify factors that affect computer performance
- Identify hardware and software considerations when purchasing a computer
- Identify other factors that go into decisions to purchase a computer including warranties and support agreements

Duty D: Identify How to Maintain Computer Equipment and Solve Common Problems Relating to Computer Hardware

- Identify how to protect computer hardware from theft or damage
- Identify factors that can cause damage to computer hardware or media (e.g. heat and humidity)
- Identify how to protect computer hardware from fluctuation in the power supply, power outages and other electrical issues
- Identify common problems associated with computer hardware such as inoperable hardware devices
- Identify common problems that can occur if hardware is not maintained properly
- Identify maintenance that can be performed routinely by users such as cleaning and defragmenting hard drives
- Identify maintenance that should ONLY be performed by experienced professionals
- Identify the steps required to solve computer-related problems

Duty E: Identify How Software and Hardware Work Together to Perform Computing Tasks and How Software is Developed and Upgraded

- Identify how hardware and software interact
- Identify simple terms and concepts related to the software development process
- Identify issues relating to software upgrades such as pros and cons and methods to upgrade

Duty F: Identify Different Types of Software, General Concepts Relating to Software Categories, and the Tasks to Which Each Type of Software is Most Suited or Not Suited

- Identify fundamental concepts relating to word processing and common uses for word processing applications
- Identify fundamental concepts relating to spreadsheets and common uses for spreadsheet applications
- Identify fundamental concepts relating to presentation software and common uses for presentation applications
- Identify fundamental concepts relating to databases and common uses for database applications
- Identify fundamental concepts relating to graphic and multimedia programs and common uses for graphic or multimedia software
- Identify the types and purposes of different utility programs
- Identify other types of software
- Identify how to select the appropriate application(s) for a particular purpose, and problems that can arise if the wrong software product is used for a particular purpose

Duty G: Identify What an Operating System Is and How It Works, and Solve Common Problems Related to Operating Systems

- Identify the purpose of an operating system and the difference between operating system and application software
- Identify different operating systems including DOS, Windows and Macintosh
- Identify the difference between interacting with character-based and graphical operating systems
- Identify the capabilities and limitations imposed by the operating system
- Identify and solve common problems related to operating systems

Duty H: Manipulate and Control the Windows Desktop, Files and Disks

- Identify elements of the Windows desktop
- Manipulate windows such as minimizing windows
- Shut down, Logoff and restart the computer
- Use the Windows Start menu and Taskbar
- Manipulate desktop folders and icons
- Manage files using the Windows Explorer/File Manager
- Identify precautions one should take when manipulating files including using standardized naming conventions
- Solve common problems associated with working with files

Duty I: Identify How to Change System Settings, Install and Remove Software

- Display control panels
- Identify different control panel settings
- Change simple control panel settings such as date and time settings
- Display and update a list of installed printers
- Identify precautions regarding changing system settings
- Install software including installing updates from online sources
- Identify common problems associated with installing and running applications

Duty J: Be Able to Start and Exit a Windows Application and Utilize Sources of Online Help

- Start a Windows application
- Exit a Windows application
- Identify and prioritize help resources, including online help within software and contacting a help desk
- Use various forms of automated help

Duty K: Identify Common On-Screen Elements of Windows Applications, Change Application Settings and Manage Files Within an Application

- Identify on-screen elements common to Windows applications (e.g. menus, toolbars and document windows)
- Display or hide toolbars
- Switch between open documents
- Change views
- Change magnification levels
- Create files
- Open files within an application and from the Windows desktop, identify file extensions including .xls or .doc

- Save files in specified locations/formats
- Close files
- Identify and solve common problems relating to working with files (e.g. product or version incompatibility)

Duty L: Perform Common Editing and Formatting Functions

- Navigate around open files using scroll bars, keyboard shortcuts, etc.
- Insert text and numbers in a file
- Perform simple editing (e.g. cut, copy and move information)
- Use the Undo, Redo and Repeat commands
- Find information
- Replace information
- Check spelling
- Perform simple text formatting
- Insert pictures into a file
- Modify pictures in a file
- Add drawn objects into a file, including creating and modifying objects

Duty M: Perform Common Printing Functions

- Format a document for printing
- Preview a file before printing
- Print files, specifying common print options
- Manage printing and print jobs
- Identify and solve common problems associated with printing

Duty N: Be Able to Format Text and Documents Including the Ability to Use Automatic Formatting Tools

- Identify on-screen formatting information, including breaks, paragraph markers etc.
- Select word, line, paragraph, document
- Change line and paragraph spacing
- Indent text
- Create and modify bulleted and numbered lists
- Use outline structure to format a document
- Insert symbols/special characters
- Insert date and time
- Insert, view and print document comments
- Display the ruler
- Use tabs
- Insert and delete a page break or section break
- Insert, modify and format page numbers
- Create, modify and format headers and footers
- Create, modify and format footnotes and endnotes
- Apply borders and shading to text paragraphs
- Create, modify and apply styles

- Copy formatting (Format Painter)
- Use language tools
- Use track changes in a document
- Display document statistics

Duty O: Be Able to Insert, Edit and Format Tables in a Document

- Create a table
- Insert and edit data in a table
- Modify table structure
- Format tables
- Sort data in a table

Duty P: Be Able to Modify Worksheet Data and Structure and Format Data in a Worksheet

- Identify how a table of data is organized in a spreadsheet
- Select information with the keyboard and mouse including selecting rows, columns and worksheets
- Insert and modify data
- Modify table structure
- Identify and change number formats, including currency, date and time and percentage formats
- Apply borders and shading to cells
- Specify cell alignment (e.g. wrapping text within a cell)
- Apply table AutoFormats

Duty Q: Be Able to Sort Data, Manipulate Data Using Formulas and Functions and Add and Modify Charts in a Worksheet

- Sort worksheet data
- Demonstrate an understanding of absolute vs. relative cell addresses
- Insert arithmetic formulas into worksheet cells
- Demonstrate how to use common worksheet functions (e.g. SUM, AVERAGE and COUNT)
- Insert formulas that include worksheet functions into cells
- Modify formulas and functions
- Use AutoSum
- Identify common errors made when using formulas and functions
- Draw simple conclusions based on tabular data in a worksheet
- Insert and modify charts in a worksheet
- Be able to identify if a presented chart accurately represents worksheet data shown in a table
- Identify appropriate chart types for presenting different types of information

Duty R: Be Able to Perform Basic Database Operations

- Design/modify a database
- Open options
- Print options
- Add/delete/edit records
- Create reports/forms using calculated fields
- Close database/exit program
- Perform queries

Duty S: Demonstrate Knowledge of Graphics Software

- Vector objects
- Lines and curves
- Fills, blends and gradients
- Front/back layering
- Text manipulation
- Bitmap/jpeg images
- Paint effects
- Paintbrush type, shade and ink
- Area textures and patterns
- Selective image manipulation
- Photo-image processing
- File format conversion
- Animation

Duty T: Be Able to Create and Format Simple Presentations

- Identify effective design principles for simple presentations
- Manage slides (e.g. delete a slide)
- Add information to a slide
- Change slide view
- Change slide layout
- Modify a slide background
- Assign transitions to slides
- Change the order of slides in a presentation
- Create different output elements (speaker's notes, handouts, etc.)
- Preview the slide show presentation
- Navigate an on-screen slide show

Duty U: Identify Network Fundamentals and the Benefits and Risks of Network Computing

- Identify terminology relating to telecommunications, networks and the Internet
- Identify types of networks
- Identify how networks work
- Identify benefits of networked computing
- Identify the risks of networked computing
- Identify fundamental principles of security on a network

Duty V: Identify the Relationship Between Computer Networks, Other Communications Networks (Like the Telephone Network) and the Internet

- Identify the different ways the telephone system is used to transmit information
- Identify that telecommunication devices such as modems convert information from analog to digital and digital to analog formats
- Identify the units used to measure data transmission rates
- Identify the Internet as a “super network” of smaller computer networks and that computers connect to the Internet via the “onramp” of a smaller computer network

- Identify the hardware and software required to connect to the Internet
- Identify different types of Internet connections and the advantages and disadvantages of each connection type
- Identify the roles and responsibilities of an Internet Service Provider (ISP)

Duty W: Identify How Electronic Mail Works

- Identify how electronic mail works on a network and on the Internet
- Identify the components of an electronic mail message
- Identify the components of an electronic mail address
- Identify when to use different electronic mail options
- Identify different ways electronic mail is accessed
- Identify the difference between standard electronic mail and other forms of messaging, such as paging or Instant Messaging

Duty X: Identify How to Use an Electronic Mail Application

- Read and send electronic mail messages
- Identify ways to supplement a mail message with additional information
- Manage attachments
- Manage mail
- Manage addresses
- Identify the purpose of frequently used mail-configuration options

Duty Y: Identify the Appropriate Use of E-mail and E-mail Related “Netiquette”

- Identify the advantages of electronic mail
- Identify common problems associated with electronic mail
- Identify the elements of professional and effective e-mail messages
- Identify when other forms of correspondence are more appropriate than e-mail
- Identify when to include information from an original e-mail message in a response as a method of tracking the “history” of e-mail communication
- Identify appropriate use of e-mail attachments and other supplementary information
- Identify issues regarding unsolicited e-mail (“spam”) and how to minimize or control unsolicited mail
- Identify effective procedures for ensuring the safe and effective use of electronic mail

Duty Z: Identify Different Types of Information Sources on the Internet

- Identify terminology related to the Internet
- Identify the purpose of a browser in accessing information on the World Wide Web
- Identify different elements of a Web site by their extensions, and the purposes of different types of sites
- Identify the difference between secure and unsecure Web sites (such as password-protected sites or sites secure for online transactions) and how to tell if a Web site is secure
- Identify different ways of communicating and corresponding via the internet

Duty AA: Be Able to Use a Web Browsing Application

- Identify the make-up of a Web address/Uniform Resource Locator (URL)
- Navigate the Web using a browser
- Reload/Refresh the view of a Web page
- Show a history of recently visited Web sites and delete the list of recently visited Web sites

- Find specific information on a Web site
- Manage Bookmarked sites/Favorite sites
- Save the content of a Web site for offline browsing
- Copy elements of a Web site including copying text or media to another application
- Print all or specified parts of a Web site
- Download a file from a Web site to a specified location
- Identify settings that can be modified in a Web browser application
- Identify problems associated with using a Web browser

Duty BB: Be Able to Search the Internet for Information

- Identify the ways a search engine classifies and looks for Web sites
- Identify other ways of searching for information on the Web
- Use a search engine to search for information based on specified keywords
- Search effectively
- Identify issues regarding the quality of information found on the internet
- Identify how to evaluate the quality of information found on the Web

Duty CC: Identify How Computers Are Used in Different Areas of Work, School and Home

- Identify how computers and the Internet are used to collect, organize, and evaluate information and promote learning
- Identify the technology and processes involved with computers operating “behind the scenes” in everyday activities
- Identify the impact of electronic commerce (e-commerce) on business, individuals and governments
- Identify technologies that support or provide opportunities to the disabled and disadvantaged such as voice recognition

Duty DD: Identify the Risks of Using Computer Hardware and Software

- Identify how to maintain a safe working environment that comply with legal health and safety rules
- Identify injuries that can result from the use of computers for long periods of time
- Identify risks to personal and organizational data
- Identify software threats, including viruses and WORMS

Duty EE: Identify How to Use Computers and the Internet Safely, Legally, Ethically and Responsibly

- Identify reasons for restricting access to files, storage devices, computers, networks, and certain Internet sites
- Identify concepts related to intellectual property laws including copyrights, trademarks and plagiarism
- Identify the principles regarding when information can or cannot be considered personal, including the difference between computer systems owned by schools or businesses that may have rules and guidelines as to who owns data stored on the system, and computers owned by individuals
- Identify how to avoid hazards regarding electronic commerce, including giving credit card information only to secure sites
- Identify how to protect privacy and personal security online, including understanding how Web sites track your activity online using “cookies” and other “behind-the-scenes” systems, licensing agreements
- Identify how to find information about rules regarding the use of computers and the Internet, including laws, use policies at school, and company guidelines at places of employment
- Identify how to stay informed about changes and advancements in technology

- Identify how to be a responsible user of computers and the Internet

Duty FF: Conducting a Podcast

- Plan a podcast
 - Topic
 - Format
 - Number of hosts
 - How many segments and what type of segment
 - Length of podcast
 - Frequency of new podcasts
 - Bandwidth concerns
 - Music within the podcast
 - Intros (theme song)
 - Transitions between segments
 - Copyright issues
 - Selecting a podcast recording location
 - Quiet and free from distractions
 - Consider sound quality (free from echoes, reverberation, etc.)
- Produce the podcast
 - Consider appropriate hardware/software needs:
 - A PC with appropriate operating system, RAM, hard drive and sound card
 - Microphone input and headphone output on your computer
 - Headphones or headset
 - Broadband internet connection
 - Audio recorder and editor
 - MP3 encoder
 - Media Player
 - File transfer software
 - Optional: MP3 player
 - Optional: Pop filter
 - Prepare the podcast episode
 - Create an outline
 - Write a script
 - Collect and organize information and audio clips
 - Record the podcast
 - Edit
- Publish the podcast to the internet
 - Register a Web Address
 - Find/buy web hosting
 - Start a blog
 - Create an RSS Feed
- Promote the podcast

Duty GG: Understand the place and benefits of handheld computers in the field of computer technology

- Learn the basic skills necessary to start using handheld computers
- Identify the hardware and software that extend the power of a handheld computer
- Demonstrate knowledge of common handheld features
 - Menu area
 - Categories
 - Home/Launcher
 - Hard buttons
 - Soft buttons
 - Navigator
 - Stylus
- Identify common applications across all models of handhelds
 - Calendar
 - Contacts
 - Memos
 - Tasks
- Identify various methods of entering text
 - Soft keyboard
 - Software
 - Synchronizing with desktop software
 - Infrared beaming
 - Bluetooth
 - External keyboard
- Demonstrate basic skills with the Calendar application
 - Launch the Calendar application
 - Switch between views (agenda, day, week, month, year)
 - Change the day view
 - Open any date
 - Make an appointment
 - Change appointment time and/or date
 - Open phone lookup
 - Demonstrate use of details dialog
 - Use details to reschedule an appointment
 - Use details to delete an appointment
 - Repeat events
 - Create alarms
 - Attach a note to an appointment
 - Demonstrate use of menus
 - Purge old events
 - Beam events
 - Set preferences
- Demonstrate basic skills with the Contacts application
 - Launch Contacts application

- Add an entry
- Customize an entry
- Create categories
- Look up an entry
- Edit an entry
- Creating and beaming an eBusiness card
- Beam a category of contacts
- Demonstrate basic skills with the Memos application
 - Launch the Memos application
 - Create a memo
 - Create a blank memo
 - Add the title
 - Categorize the memo
 - Complete the memo
 - Navigate through a memo
 - Edit text
 - Select text
 - Edit with menu commands or by use of the command bar
 - Create private records
 - Mark an individual item as private
 - Mask or hide a private item from view
 - Mark a record as private
 - Set current privacy
 - View a masked item
 - Establish system security
 - Set a password for the handheld
 - Set current privacy
 - Set when the hand held autolocks
 - Use the functions of the memos menu
 - Delete, sort, and beam (single and category) memos
 - Set font size preference
- Demonstrate basic skills with the Tasks application
 - Launch the Tasks application
 - Create a new task
 - If needed, set priority
 - If needed, attach a note
 - Enter text
 - Complete task entry
 - Create a details dialog box
 - Use details to gain control over tasks
 - Delete individual tasks
 - Set preferences
 - Customize the tasks list
 - Use the functions of the Tasks menu

Purge completed tasks
Beam a task or a category of tasks
Set font size preferences

Duty HH: Demonstrate Knowledge of Geographic Information Systems (GIS)

- Define a Geographic Information System and its possible uses
 - GIS is the software that organizes, analyzes, and maps the geospatial data
 - Possible uses include:
 - Scientific investigations
 - Resource management
 - Development planning
- Demonstrate understanding of the technologies used in geographic inquiry (e.g., Geographic Information Systems (GIS), hypermedia)
- Demonstrate an understanding of the methods used to collect, organize, manipulate, and interpret geographic data
 - Spatial/geospatial relationships
- Select and use appropriate technology (e.g., computer-generated maps, graphs, air photos, digital maps) to present geographic information
- Create and use effectively photographs, charts, graphs, models, and diagrams; use different types of maps (e.g., road, topographical, thematic) to interpret geographic relationships, including changes over time in a specific location.
- Use cartographic conventions correctly when describing/constructing maps. (e.g., scale, legend, directions)
- Demonstrate the ability to make observations and collect data in the field
- Identify selected physical features on the earth's surface (e.g., mountains, rivers, deserts) from different sources (e.g., maps, aerial photographs, satellite images, geographic imaging systems).
- Produce and interpret maps, diagrams, charts, and models.
- Use remote sensing imagery, maps, global positioning systems, and geographic information systems to measure conditions on the ground (e.g., health of vegetation).
- Define meridians and parallels and explain geographic coordinates (latitude and longitude) and rectangular coordinates (x,y)
- Identify important map projections and describe their main properties.
- Demonstrate an understanding of the concept of scale and the distinctions between large and small scale and between data scale and display scale.
- Demonstrate an understanding of the ArcGis software
 - ArcReader
 - ArcView
 - ArcEditor
 - Arcinfo
- Describe the use of geotechnologies, especially GIS, for such business-related purposes as marketing and advertising, vehicle routing, site selection, and redistricting.
- Identify local government departments that make significant use of geotechnologies and spatial data (e.g., engineering, planning, health, utilities, police, environment).
- Describe the use of geotechnologies for such government-related purposes as land use planning, land registration, facilities management, and property assessment.
- Identify applications of geotechnologies relating to resources and the environment (e.g., species mapping, weather forecasting, forest management, precision farming)

Duty II: Demonstrate Knowledge of Global Positioning Systems (GPS)

- Define a Global Positioning System and identify GPS system segments
 - GPS is the hardware that provides geospatial data
 - GPS system segments include:
 - GPS satellite constellation
 - Operational Control Segment (OCS)
 - User receiving equipment
- Demonstrate GPS system operation
 - Determining your position/location
 - Measuring your distance/position/speed/height/direction
 - Error correction
 - Differential GPS
 - Carrier-phase GPS
- Identify uses of GPS technology
 - Location
 - Navigation
 - Tracking
 - Mapping
 - Timing
- Identify GPS competitors
 - GLONASS
 - Galileo

Duty JJ: Demonstrate Knowledge of a Content Management System (CMS)

- Define the purpose and features of a Content Management System (CMS)
 - Adds and/or manipulates content on a Web site
 - Web-based
 - Format management
 - Revision control
 - Indexing
 - Search and retrieval
- Identify the two primary elements of a CMS
 - Content Management Application (CMA)
 - Content Delivery Application (CDA)
- Define the purpose of the CMA
 - Allows the content manager or author, who may not know HTML, to manage the creation, modification, and removal of content from a Web site without needing the expertise of a Webmaster
- Define the purpose of the CDA
 - Uses and compiles information to update the Web site

Duty KK: Demonstrate Knowledge of a Learning Management System (LMS)

- Define the purpose of a Learning Management System (LMS)
- Identify the characteristics of a LMS:
 - Manages users, roles, courses, instructors, and facilities

- Generates reports
- Maintains course calendar
- Learner messaging and notifications
- Assessment/testing capability
- Grading of coursework and roster processing, including waitlisting
- Web-based or blended course delivery
- Develop a LMS
 - Modify the course menu
 - Input text and upload content into the course
 - Create and participate in an asynchronous threaded discussion
 - Utilize the assignment tool to circulate and collect information
 - Build and deploy a simple test
- Navigate the LMS
 - Differentiate between system and course roles
 - Create, manage, and remove user accounts and courses
 - Designate the availability status of system-wide tools and utilities
 - Establish a default institution brand
 - Perform timely user and course maintenance
 - Secure the application

Duty LL: Demonstrate Digital Video Literacy

- Define and state the skills needed for Digital Video Literacy
 - Critically evaluate digital visual materials (2D and 3D, static and moving)
 - Make decisions using digital visual representations of data and ideas
 - Create effective visual communications with computers
- Create a visual display of information using presentation software
- Design a word processing document using typography and visuals
- Create a spreadsheet document with charts and graphs
 - Define the purpose of the chart (influence vs. inform)
 - Charts and graphs should:
 - Present the true picture
 - Influence decisions
 - Select the type of chart or graph that will give a clear picture
 - Clarify the meaning of the data
 - Charts are computer graphics and the following design principles should be applied:
 - Contrast
 - Repetition
 - Alignment
 - Proximity
- Identify the importance of Digital Video Literacy in blogs.

Duty MM: Demonstrate Knowledge of Web Accessibility

- Define Web Accessibility and demonstrate understanding of the basic requirements set forth by the World Wide Web Consortium (W3C) and the Web Accessibility Initiative (WAI)
- Demonstrate understanding that Web Accessibility may involve corporate or local, state, and/or Federal government requirements.
- Demonstrate understanding that Web accessibility includes:
 - Web sites and applications:
 - that people with disabilities can perceive, understand, navigate, and interact with
 - Web browsers and media players:

- that can be used effectively by people with disabilities
 - that work well with assistive technologies that some people with disabilities use to access the Web
 - Web authoring tools and evolving technologies:
 - that support production of accessible Web content and Web sites
 - that can be used effectively by people with disabilities
- Identify the essential components of Web Accessibility
 - Content
 - Web browsers, media players and other “user agents”
 - Assistive technology
 - User’s knowledge, experiences, and in some cases, adaptive strategies using the Web
 - Developers
 - Authoring tools
 - Evaluation tools
- Demonstrate knowledge of key concepts of accessible Web design
 - Images and animations
 - use the alt attribute to describe the function of each visual
 - Image maps
 - use the client-side map and text for hotspots
 - Multimedia
 - provide captioning and transcripts of audio and descriptions of video
 - Hypertext links
 - use text that makes sense when read out of context. For example, avoid ”click here”
 - Page organization
 - use headings, lists, and consistent structure. Use CSS for layout and style where possible
 - Graphs and charts
 - summarize or use the longdesc attribute
 - Scripts, applets, and plug-ins
 - provide alternative content in case active features are inaccessible or unsupported
 - Frames
 - use the noframes elements and meaningful titles
 - Tables
 - make line-by-line reading sensible (summarize)
 - Validate
 - use tools, checklist, and guidelines at <http://www.w3.org/TR/WCAG/>

Duty NN: Demonstrate Understanding of Digital Media

- Define Digital Media and identify different areas of concentration within Digital Media
 - Game design/programming
 - 3D modeling
 - Web design/programming
 - Digital audio
 - Video editing
- Demonstrate knowledge of film and digital media
 - Digital media principles
 - Foundations of story
 - Cinematic expression/aesthetics
 - Script analysis
 - Foundations of production
- Demonstrate knowledge of “visual language” (the language of moving image, animation, and cinematic visual effects)
 - Drawing fundamentals
 - Concepts of computer science

- Study of moving images
- Artificial environments and effects
- Artificial characters
- Visual storytelling and development
- Writing for digital media
- Production process
- Production software
- Digital imagery (generating and manipulating)
- Digital audio
- Sound design
- Internet interaction
- Modeling
- Media design
- Game design

Duty OO: Demonstrate Knowledge of Security Awareness

- Explain the roles of security policies, standards, guidelines, and procedures.
- Examine the general security concepts and relationships as outlined in the Common Criteria
- Describe the concepts of confidentiality, integrity, availability, identification, authentication, authorization, accountability, and non-repudiation
- Define and explain the roles of prevention, detection, and response in cyber security
- Compare and contrast issues associated with host, network, and physical security
- Discuss layered defense-in-depth components and strategies
- Identify and define methods of hardening a computer host (limiting services, securing default configurations, disabling/renaming default accounts, privilege-
- Limited accounts and processes, cryptography, operating system and application patching, host firewall configuration, anti-malware definition updates and scanning)
- Identify and define methods of hardening a computer network (protecting access to sensitive data through the use of zoned firewalls, proxy servers, virtual private networks, access controls)
- Identify and describe common security threats and mitigation techniques, including physical (utilities, environmental, access), malware (Trojans, rootkits, viruses, spyware scripting languages, keyloggers), Internet (browser, e-mail), and social engineering exploits (password compromise, phishing, piggy-backing, dumpster diving discarded media and hard drives)
- Compare and contrast typical attacker profiles (hackers, script kiddies, spies, thieves, insiders, cyber terrorists)
- Identify and discuss contemporary attack styles (DoS, zombies, botnets, MITM, hijacking and spoofing, sniffing)
- Identify and discuss contemporary cyber security issues and related legislation (identify theft, corporate espionage, cyber warfare)
- Identify and discuss typical user behaviors contributing to cyber security issues (connecting to sites where attacks are more prevalent, including e-commerce and social-networking portals, taking phishing links, failing to verify certificates, failing to employ host and network security)
- Identify and discuss components and strategies of disaster recovery, business continuity, and incident response plans

Duty PP: Demonstrate Knowledge of Leadership

- Identify leader characteristics
 - Ethics
 - Intelligence
 - Judgment
 - Objectivity
 - Initiative

- Take ownership of situations
- Dependability
- Cooperation
- Honesty/Integrity
- Courage
- Confidence
- Stability
- Understanding
- Creativity
- Teamwork
- Responsibility
- Flexibility
- Identify leadership styles
- Identify professional and community organizations
 - Student organizations
 - Civic organizations
 - Professional organizations
 - Social organizations
- Participate in student organization activities and various projects on the local, state, and national levels

Duty QQ: Complete an Employment Process

- Set occupational objectives such as
 - Entrepreneurship
 - Self-employment
 - Full-time
 - Part-time
- Compose a letter of application
- Create a resume
 - Hard copy
 - Electronic format
- Create a portfolio
 - Hard copy
 - Electronic format
- Review potential interview questions and techniques
- Formulate responses to simulated situations
 - Mock interview
 - Prepare questions for prospective employers
- Participate in job interview
 - Job interview etiquette
 - Application form
 - Appropriate dress
 - Submit an original copy of resume
 - Research company history
- Complete post-interview activities

- Follow-up thank you letter
- Follow-up inquiry call
- Demonstrate knowledge of available employment services
 - Online searches
 - Private
 - State
 - Federal
- Complete job acceptance
 - Negotiate salary
 - Negotiate benefits
 - Complete benefits forms
- Discuss legal issues
 - Drug screen
 - Discrimination
 - Harassment
- Compare and evaluate career and training opportunities
 - Networking
 - Professional organizations
 - Educational requirements
 - Salaries
 - Projected labor market
 - Career/job ladder
 - Self-initiative
 - Transfer skills
 - Flexibility
 - Major functions of a company and job levels within these functions
- Demonstrate knowledge of resignation, termination, and exit interview practices

Methods of Instruction include:

lectures, class discussions, hands-on training, demonstrations, projects and performance evaluation

Evaluation/Grading System:

- Ads 100 points
- Deadlines 30 points
- Assignments 25 points
- Projects 25 points
- Weekly Participation Grade 10 points
- Test/Quizzes 50 to 100 points

Grading Scale:

- 90-100 A
- 80-89 B
- 70-79 C
- 60-69 D
- 0-59 F

Required Testing

Brainbench (choose one):

- Computer Fundamentals or
- Computer Literacy (Duties A-F)

Course Textbooks and Instructional Resources:

- Donald Cooke, *Fun with GPS*, ESRI Press, 2005
- Connie Morrison, Dolores Wells, *Computer Literacy Basics, A Comprehensive Guide to IC3, 3rd Edition*
- Burt Lo, *GPS and Geocaching in Education*, ISTE 2010
- Shelly Cashman, *Discovering Computers & Microsoft Office 2010*,
- Christopher Shamburg, *Student-Powered Podcasting*, ISTE, 2009
- Tasha Wade and Shelly Sommer, *A to Z GIS*, ESRI Press, 2006

Recognized Online Instructional Resources:

- LearnKey (statewide agreement): www.learnkey.com