Wisconsin Youth Apprenticeship

INFORMATION TECHNOLOGY (IT)

PROGRAM GUIDE

Investing in
Wisconsin's Future

Department of Workforce Development

August 2010

For more information contact:

Department of Workforce Development
P.O. Box 7972
Madison, WI 53707-7972

INFORMATION TECHNOLOGY (IT)
YOUTH APPRENTICESHIP
PROGRAM GUIDE

Description

The information technology (IT) industry is among the economy's largest and fastest sources of employment growth[1]. U.S.-based companies will be looking to employ workers to serve both U.S. and global markets. Concurrently, rapid advances in technology have meant that today's global business structure has created a truly international IT employment marketplace[2].

The IT career cluster involves careers in the design, development, support, and management of hardware, software, multimedia, and systems integration. The IT industry is a dynamic and entrepreneurial working environment that has revolutionary impact on the economy and society. In addition to careers in the IT industry, IT careers are available in every all industries of the economy. This Youth Apprenticeship occupational area focuses on the pathways within the Information Technology (IT) industry: Network Systems, Information Support & Services, Web & Digital Communications, and Programming & Software Development[3]. Job growth in all four pathways is expected to be faster than average through 2018[1].

Careers in Network Systems involve network analysis, planning, and implementation, including design, installation, maintenance and management of network systems. Successful infrastructure is critical to almost every 21st century organization. People with expertise in Network Systems are in high demand for a variety of functions. Careers in Information Support and Services include managing the computer systems and software and providing technical support. Functions such as integrating multiple databases, connecting data and employees globally, and improving IT services are key components of this career pathway. The Programming and Software Development pathway encompasses careers that design, develop, implement and maintain computer software and its operation on various systems. Workers in the Web & Digital Communications pathway are involved in creating, designing and producing multi-media products and services used in business, training, entertainment, communications and marketing[3].

---

[1] U.S. Dept. of Labor, High Growth Industry Profile: Information Technology. www.doleta.gov. Accessed 3/31/10.
[2] Info Tech Employment, IT Employment Trends. www.infotechemployment.com. Accessed 3/31/10.
[3] States' Career Clusters, IT Cluster Brochure. www.careerclusters.org. Accessed 3/31/10.

The Youth Apprenticeship Program was approved by the Wisconsin State legislature in 1991 to provide a direct link between business, schools, and youth to meet the demands of technology, teamwork, communication, and leadership.

Wisconsin Youth Apprenticeship (YA) is a rigorous program that combines academic and related technical classroom instruction with mentored on the job learning for high school students. By training youth apprentices, employers play an active role in shaping the quality of their future workforce, improving the skill level of potential workers, and enhancing their competitive positioning in the marketplace. Employers, school districts, local consortiums, parents, and potential YA students are referred to the Youth Apprenticeship Program Operations Manual for general YA Program requirements.

Objective

The Wisconsin Information Technology (IT) YA Program is designed to provide students with a working understanding of occupational and technical skills in the four pathways within the IT industry. This program provides the framework for educators and industry to work together to produce work-ready, entry-level employees that will compete favorably in a global market, as well as, provide for post-secondary educational advancement while integrating work-based learning in the school and worksite.

The following features distinguish a YA Program from other similar youth school to work programs.

- Level Two Youth Apprenticeship is a two-year program for high school juniors and seniors with an interest in a particular field; i.e., computer programming. One-year Youth Apprenticeship Programs are also available to pursue.
- Youth apprentices, parents, employers, YA program coordinators, and school districts enter into a written agreement approved by the Department of Workforce Development.
- Statewide skills are established by the industry, making the youth apprentice skill set more relevant to the state's employers.
- Youth apprentices are trained at the worksite by skilled mentors and are paid minimum wage or better for their work. Students average 10-15 hours/week.
- Youth apprentices receive a high school diploma and a Certificate of Occupational Proficiency from the Wisconsin Department of Workforce Development (DWD) at graduation.
- Youth apprentices may receive advanced standing credit and/or transcripted credit for the YA Program at a Wisconsin Technical College and/or at some four year colleges. See **Appendix F** for current details.
- Statewide skill standards focus on skills and knowledge needed by employers for entry level employment in the IT industry.

Students apply and are interviewed by IT employers for positions in the IT YA Program. The state approved skill standards and program guide for the Information Technology (IT) YA Program are used in both the classroom instruction and worksite learning. If the local school district is unable to provide the related technical classroom instruction courses, they may contract with their local technical college or employer practitioners to do so.

The skill standards are competency based. Competencies are performance-based outcome statements of occupational related skills defined by representatives of IT worksites throughout Wisconsin and aligned with national skill standards. The competencies in the program are aligned with learning objectives in the CISCO IT Essentials program (http://www.cisco.com/web/learning/netacad/course_catalog/IT1.html), and the standards and knowledge statements outlined in the National States' Career Cluster Skill Standards (http://www.careerclusters.org/) for the four IT Career Cluster pathways: Network Systems, Information Support & Services, Web & Digital Communications, Programming & Software Development.

The competencies will be taught at the worksite in combination with supportive, related technical classroom instruction. While the skill competencies are established statewide, program implementation and oversight occurs through local consortium committees to assure local needs are met.

Target Population

This Youth Apprenticeship occupational area focuses on students developing skills in one or two of the four pathways in the IT industry: Network Systems, Information Support & Services, Web & Digital Communications and Programming & Software Development.

The **IT Essentials** unit covers basic skills pertinent to working with computer devices and application set up and support. The **Hardware** unit combines elements from the IT Network Systems pathway and the Information Support & Services pathway. This unit is appropriate for students who like problem solving while learning more deeply about communication systems between computers to meet business needs. The **Software** unit combines skills from the IT Programming & Software Development pathway and the Information Support & Services pathway. This unit provides opportunities to work with and manipulate the data that is managed by IT systems, as well as, work with professionals to evaluate and customize programming to meet business needs. The **Web & Digital Media** unit allows students who are interested in computers to combine their strong interests in design and creativity. Aligned with the Web & Digital Communications pathway, this unit allows students to work on web pages developing content, design, and scripts for business purposes. **ALL units** include an emphasis on working with an IT project team to accomplish required tasks.

All students successfully meeting current high school graduation requirements and with a good attendance record for that year are encouraged to apply for the Information Technology (IT) Youth Apprenticeship (YA) Program. The student must apply to the program in the year previous to program entry and be on track toward fulfilling high school graduation requirements in their school district. SEE **Appendix G** for students entering or continuing the IT YA Program in 2010.

All Youth Apprentices must complete the industry-wide foundational skill competencies consisting of competencies in core employability skills and safety & security. The Required Skill competencies may be completed concurrently with the specific technical skills.

Potential youth apprentices will be required to complete a minimum of 450 work hours with 180 hours (2 semesters) of related technical classroom instruction for a Level One (1-year) Information Technology (IT) YA Program or a minimum of 900 work hours with 360 hours (4 semesters) of related technical classroom instruction for a Level Two (2-year) IT YA program.

IT YA students are required to perform all of the Core and Safety & Security skills. **Level One (one year)** YA students also take additional competencies in a minimum of specific pathway unit. **Level Two (two year)** YA students are to choose another specific pathway unit based on their area of interest and their worksite placement.

IT Units

1. **General IT Pathway-**

   - IT Essentials Unit

2. **Network Systems and Information Support & Services Pathway**.

   - Hardware Unit

3. **Programming & Software Development and Information Support & Services Pathway**

   - Software Unit

4. **Web & Digital Communications Pathway**

   - Web & Digital Media Unit

Information Technology (IT) Program Responsibilities

The following responsibilities are outlined for individuals involved in the Information Technology (IT) YA Program.

Students –

1. Maintain academic skills and attendance at the high school to remain on track for high school graduation.
2. Participate in progress reviews as scheduled.
3. Exhibit maturity and responsibility to meet requirements of employment as designated by the employer.

Parents or Guardians-

4. Ensure that adequate transportation is available to and from the worksite.
5. Participate in student progress reviews as scheduled.

School District-

6. Recruit students and coordinate student enrollment in the program with the consortiums and/or employers.
7. Integrate the YA Program related technical classroom instruction and worksite training into the student's overall education program with high school graduation credit issued for each semester successfully completed.
8. Participate in student progress reviews as scheduled.

YA Program Coordinators-

9. Apply and maintain approval from the DWD to operate a YA Program.
10. Ensure a minimum of 450 hours of worksite instruction/experience plus a minimum of 180 hours of related technical classroom instruction for each one year YA program.
11. Establish and meet regularly with an advisory committee that will identify when and where tasks will be taught during the IT YA Program.
12. Develop and maintain a yearly commitment with participating high schools, technical colleges, and local businesses to accommodate the number of students involved in the IT YA Program.
13. Establish and maintain a YA student grievance procedure.
14. Provide employer mentor training.

Related Technical Classroom Instruction Faculty-

15. Qualify in the specialty areas being taught in the YA Program.

Employers and Worksite Mentors-

16. SEE **Appendix B –** Information Technology (IT) YA Implementation Guide for Employers.

17. Participate in a mentor training session and provide on the job training of the Youth Apprentices.

Department of Workforce Development-

18. Monitor national and state regulatory agencies, such as OSHA, for changes and impact on the IT Youth Apprenticeship Program.

Program Guide Organization

The competencies in the Information Technology (IT) YA program include many of those required for the CISCO IT Essentials program (http://www.cisco.com/web/learning/netacad/course_catalog/IT1.html), and the standards and knowledge outlined in the National States' Career Cluster Skill Standards (http://www.careerclusters.org/) for the Information Technology (IT) Career Cluster pathways.

The IT YA Program also requires that Related Technical Classroom Instruction is provided to support attainment of the knowledge necessary to master the competencies. While recommendations for specific Related Technical Classroom Instruction are detailed separately in **Appendix C**, instructional requirements will vary depending on local consortium and advisory group decisions. It is strongly advised that local consortiums work with their advisory groups to determine appropriate Related Technical Classroom Instruction based on their local needs and resources.

The Youth Apprenticeship Program curriculum is written and organized according to the Worldwide Instructional Design System (WIDS) format and includes the Information Technology (IT) YA Skill Standards Checklist and Course Outcome Summary (COS) for the program. Overall progress is documented on the Skill Standards Checklist which lists skill level achievement for each competency achieved. The COS outlines each skill competency with its corresponding performance standards and learning objectives. The Performance Standards describe the tasks and behaviors, as applicable, that employers should look for in order to evaluate the competency. The Learning Objectives outline the required content to be covered in the related technical classroom instruction. SEE **Appendix D** - Wisconsin Instructional Design System (WIDS) Format and Youth Apprenticeship Program Guide Terms and **Appendix E** - Use and Distribution of the Curriculum for further details.

Evaluation

The student must successfully complete the related technical classroom instruction and demonstrate the minimum skill level required on the Information Technology (IT) YA Skill Standards Checklist for each competency according to the applicable curriculum. Worksite mentors and/or instructors use this checklist to evaluate the learner on each of

the required skills. It is the responsibility of the mentor(s) to rate the students skill level on all tasks performed at the worksite.

Information Technology (IT) YA Program Completion

Upon successful completion of high school and the Level Two (2 year) IT YA Program requirements, the youth apprentice will receive a high school diploma and the applicable Certification of Occupational Proficiency from the Department of Workforce Development indicating "Information Technology (IT) Youth Apprenticeship." Youth Apprentices who successfully complete a Level One (1 year) IT YA Program and who are on track for graduation will be eligible for a Level One Certificate from the Department of Workforce Development. Furthermore, the YA students may;

1. Continue to work in the IT industry.
2. Apply to a registered apprenticeship.
3. Pursue a degree or diploma from a Wisconsin Technical College with advanced standing and/or transcripted credit.
4. Apply for admission to a four-year University of Wisconsin school with high school academic elective credit for admission.
5. Go into military service.

SEE **Appendix F** for current agreements for post-secondary credit at Wisconsin Technical Colleges and University of Wisconsin colleges.

Appendices

Appendix A - Work Contracts, Child Labor Laws, Liability & Insurance

Appendix B - Information Technology (IT) YA Implementation Guide for Employers

- Benefits to the Employer
- Role of the Employer
- Role of the Mentor
- Checklist for Program Participation
- Checklist for Program Operation
- Frequently Asked Questions
- Work Contracts, Child Labor Laws, Liability & Insurance (insert Appendix A)

Appendix C - Recommended Related Technical Classroom Instruction

Appendix D - Wisconsin Instructional Design System (WIDS) Format and Youth Apprenticeship Program Guide Terms

Appendix E - Use and Distribution of the Curriculum

Appendix F - Post Secondary Credits

Appendix G - Grandfather Clause – Program Transition Guidelines

Appendix H - Information Technology (IT) Skill Standards Checklist

Appendix I - Information Technology (IT) YA Course Outcome Summary: Overview and Table of Contents (COS)

Appendix J- Information Technology (IT) Required Skills Curriculum (Units 1-2)

Appendix K- IT Essentials Unit (Unit 3)

Appendix L- Hardware Unit (Unit 4)

Appendix M- Software Unit (Unit 5)

Appendix N- Web & Digital Media Unit (Unit 6)

Appendix A

WORK CONTRACTS, CHILD LABOR LAWS, LIABILITY & INSURANCE

WORK CONTRACTS

Education Training Agreement -

Students and employers participating in an approved youth apprenticeship program must have a signed Education/Training Agreement (ETA) on file with both the school and the employer. Employers without a valid ETA may be assessed (a) double compensation in the event of injury on the job, and/or (b) fines ranging from $25 to $1,000 for every day without a permit for a first offense to $250 to $5,000 for every day without a permit for a second offense within a five year period. The Local Youth Apprenticeship Coordinator will provide the employer with a copy of the ETA. This form is also available from the Department of Workforce Development at
http://dwd.wisconsin.gov/youthapprenticeship/forms_pubs.htm

Work Permits -

Students and employers participating in an approved youth apprenticeship program do not need to obtain a separate work permit for the work to be performed as a part of the youth apprenticeship program, although it is highly recommended. If employers hire the youth apprentices to perform other work duties outside of their youth apprenticeship duties, a work permit will be required. Employers without a valid work permit (if applicable) may be assessed (a) double compensation in the event of injury on the job, and/or (b) fines ranging from $25 to $1,000 for every day without a permit for a first offense to $250 to $5,000 for every day without a permit for a second offense within a five year period.

CHILD LABOR LAWS

Youth apprentices enrolled in approved youth apprenticeship programs and their employers are subject to all state and federal child labor laws regarding the employment of minors. The Department of Workforce Development (DWD) will review all statewide youth apprenticeship curriculum for compliance with the child labor laws and will clarify the laws whenever necessary to allow for program implementation. Youth apprentices are allowed to work in some prohibited occupations because they meet the criteria of "student learner" as defined in the law, but they are not exempt from the child labor laws by virtue of being enrolled in a youth apprenticeship program. Students and employers must comply with child labor laws with regard to daily/weekly hours, time of day, employment, etc.

While DWD can interpret the law, DWD cannot exonerate employers from liability should an accident occur on the job which results in injury to an employee and a subsequent lawsuit. Determining liability for an accident can only be settled in a court of law. DWD can assure employers that they will not be cited (by DWD) for illegally employing a minor in a prohibited occupation as long as the students are enrolled in a DWD approved youth apprenticeship program and a signed Education/Training Agreement is on file with both the student's high school and the employer. This means that employers will not be assessed treble fines should an injury occur which results in the employer being cited.

Readers should refer to DWD 270.12 and 270.14 Child Labor Laws for descriptions and definitions of the occupations or activities which are normally prohibited to minors.

DWD 270.12(21) Motor vehicle driver and outside helper.
Minors under age 17 cannot drive as part of their job (based on October 1998 U.S. Dept. of Labor revision (98-464))

A minor, age 17, may operate a motor vehicle as a part of employment if:
1) the vehicle does not exceed 6,000 pounds gross weight;

2) driving is done during daylight hours only;

3) the driving amounts to no more than 20% of the work week or 1/3 of the work day;

4) the student has attended drivers' education training and holds a valid driver's license;

5) the driving takes place within a 30-mile radius of the minor's place of employment;

6) the minor has no record of any moving violations at the time of hire; and

7) the driving does not involve: towing of vehicles, route deliveries or sales, transportation for hire, urgent time-sensitive deliveries, transporting more than 3 passengers who are employees of employer at one time.

Student Learner Criteria -

In order to be considered a student learner, youth apprentices must meet the following criteria:

1. They are enrolled in a youth apprenticeship program approved by DWD;
2. They are enrolled in school and receiving school credit for program participation;
3. They receive appropriate safety instruction at the school and at the workplace;
4. The work performed is under direct and close supervision of a qualified and experienced person;
5. The work performed in any occupation declared hazardous is incidental to their training and is for intermittent and short periods of time (refer to DWD 270.14(3)(c)1; and
6. There is a schedule of organized and progressive work processes to be performed on the job (i.e. the worksite is following the state curriculum);

Hours of Work -

The hours an apprentice spends working in the program *during* the hours school is in session during the day <u>DO NOT COUNT</u> towards the limitation on total hours a minor may work. See the DWD [Child Labor](#) web site for applicable hours and times of the day that minors may work in Wisconsin.

LIABILITY AND INSURANCE

As employees of the company, youth apprentices are covered by worker's compensation in the event of injury on the job. Employers should review their specific liability coverage to ensure there are no restrictions on employing minors and/or on coverage of minors operating particular machinery. Schools are not allowed to cover youth apprentices through their own workers' compensation policy while the youth apprentice is an employee of the local business.

As stated previously, DWD and/or local schools cannot exonerate employers from liability if a youth apprentice is injured on the job and a subsequent lawsuit is filed against the employer. Determining liability for an accident can only be settled in a court of law and will be based on the specific circumstances for each case. It is important that a signed ETA be on kept on file by both the school and the employer to ensure that employers will not be cited for illegally employing a minor in a prohibited occupation.

General Liability –

An employer is liable for the service provided at their facility. In general an employer has adequate general liability and workers compensation coverage, no additional liability is required as a result of the Youth Apprenticeship program. However, before participating in the program, an employer may wish to consult with their insurance carrier.

Transportation –

In general, the party responsible for transportation is liable in case of an accident. Youth apprentices responsible for their own transportation to and from the worksite are responsible for their own insurance. In instances where the school provides transportation for the youth apprentices, the school is responsible for insurance coverage. Only if the facility provides transportation to and from work for the youth apprentice is the facility responsible for this insurance coverage.

Workers Compensation –

Once a youth apprentice becomes a paid employee they must be covered by the employer's workers compensation coverage.

Unemployment Compensation –

If a youth apprentice is enrolled full-time in a public educational institution and receives school credit for their participation in the YA program, then they are NOT eligible to file for unemployment compensation from the employer. Youth apprentices who do NOT meet this criteria may be eligible for unemployment compensation benefits.

Worker Displacement –

No employer may hire a youth apprentice who will displace any currently employed worker, including a partial displacement, such as reduction in the hours of non-overtime work, wages, or employment benefits.

Layoffs/Strikes –

A youth apprentice cannot be hired when any other individual is on temporary layoff, with the clear possibility of recall, from the same or equivalent job OR if the employer has terminated the employment of any regular employee, or otherwise reduced the workforce, with the intention of filling the vacancy created with a youth apprentice. Local bargaining units should determine the status of youth apprentices already working in the facility in the event of a layoff. Youth apprentices may be laid off or transferred to work areas to take the place of laid off workers. Child labor laws prohibit youth apprentices from working in a company where a strike or lockout is in active progress.

Collective Bargaining Agreements –

The youth apprenticeship program should not impair existing contracts for services or collective bargaining agreements. Any youth apprenticeship program that would be inconsistent with the terms of a collective bargaining agreement shall be approved only with the written concurrence of the labor organization and employer involved.

Appendix B

Wisconsin Information Technology (IT) Youth Apprenticeship
Implementation Guide for Employers

BENEFITS TO THE EMPLOYER

The information technology (IT) industry is among the economy's largest and fastest sources of employment growth[1]. U.S.-based companies will employ to serve U.S. and global markets. Globalization has created a truly international IT employment marketplace[2]. The Information Technology (IT) Youth Apprenticeship Program was designed with the needs of employers in mind. Employers across all industries have expressed concern that the education system has not adequately prepared young people with the work readiness and technical skills necessary to meet their business needs. This program was developed with the Wisconsin Technical College System and employer representatives from different IT industries to meet the needs of you, our IT employers.

By working with the IT Youth Apprenticeship Program you make an investment in the young people in your community. You will have access to a dependable recruitment pipeline of entry level workers that can be used to increase workforce diversity and provide supervisory opportunity for staff. You will be directly involved in the economic development efforts of your community as well as become a part of the creation of highly skilled workers, an excellent point in any public relations marketing.

A unique opportunity and added incentive for participation in the IT Youth Apprenticeship Program for both the employer and the student is that the competencies are directly aligned with the curriculum objectives of the CISCO IT Essentials course for PC Hardware and Software, the national occupational skill standards recognized by the National States' Career Cluster Skill Standards in Information Technology (IT), http://www.careerclusters.org/, and the Secretary's Commission on Achieving Necessary Skills (SCANS).

Employers also play an active role in improving the quality of the future workforce by helping develop skill standards geared to employer needs, reducing employee turnover by hiring program graduates, supporting program graduates as they continue their education in post-secondary settings, raising the interest of other employees in education and training, and increasing the potential for teamwork and flexibility in work sharing. One employer noted, "This program is the single most effective use of taxpayer dollars to link our business community to the workforce and training needs of the community. We must expand, celebrate, promote and encourage participation in this endeavor. I have personally gained staff, changed some lives, and enjoyed the

---

[1] U.S. Dept. of Labor, High Growth Industry Profile: Information Technology. www.doleta.gov. Accessed 3/31/10.
[2] Info Tech Employment, IT Employment Trends. www.infotechemployment.com. Accessed 3/31/10.

successes of the participants. It has enriched our staff in learning to operate as mentors, and enhanced our perception in the community as involved participants."

ROLE OF THE EMPLOYER

The work-based learning component of the Youth Apprenticeship Program is the **primary** method for teaching the required competencies. The local business becomes an extension of the classroom for the youth apprentice. The related classroom instruction is intended to *support* the work-based learning experience by providing theoretical knowledge and, when needed, providing appropriate skill development. The work-based learning component is designed to provide an on-the-job learning environment for students by being "apprenticed" to an experienced mentor.

As an employer of a youth apprentice, you will be responsible for the following:

Student Selection
Review employment applications, interview candidates, and select the student(s) they want to hire. New Employee Orientation is provided by you according to your facility's Human Resources policies.

Wages
Youth apprentices must receive minimum wage or higher. A pay schedule is agreed upon with the employer, local YA coordinator and the student. Most employers grant periodic raises dependent upon performance or length of employment.

Workers Compensation
Once a youth apprentice becomes a paid employee they must be covered by the employer's workers compensation coverage. Other benefits may be provided at the discretion of the employer.

Education/Training Agreement (ETA)
Employers must sign and comply with the requirements in the ETA, and have a copy on file. See *Appendix A* "*Work Contracts, Child Labor Laws, Liability & Insurance"* for more detail.

Work Permits
See *Appendix A* "*Work Contracts, Child Labor Laws, Liability & Insurance"* for more detail.

Child Labor Laws
Employers must ensure that the work of any student at their worksite is allowed by Child Labor Laws and is under the direct and close supervision of a qualified and experienced person. Students must be provided with adequate safety training both in the school and at the worksite. All IT Youth Apprenticeship skill standards competencies have been

reviewed by the Wisconsin Department of Workforce Developments Labor Standards Bureau and are in compliance with the child labor rules.
See *Appendix A* "*Work Contracts, Child Labor Laws, Liability & Insurance"* for more detail.

Unemployment Compensation
YA students are typically not eligible for unemployment compensation from the employer.
See *Appendix A* "*Work Contracts, Child Labor Laws, Liability & Insurance"* for more detail.

Job Performance
Employers review, evaluate, and report on the youth apprentice's job performance approximately every nine weeks to ensure they are learning the required competencies. Mentors are expected to participate in progress reviews with the apprentice, school staff and/or Youth Apprenticeship instructors, and parent(s)/guardian(s).

Worksite Hours
Employers must provide for the youth apprentice to meet the following work requirements:

Youth Apprentices in a Level Two (2-year) program must complete a *minimum* of 900 hours of work-based learning while they are enrolled in the program. At least 500 hours of the required minimum work-based learning hours must take place when related classes are being held, so that classroom instruction can be integrated with worksite learning.

Youth apprentices in a Level One (1 year) program must complete a *minimum* of 450 hours of work based learning while they are enrolled in the program. At least 250 hours of the required minimum work-based learning hours must take place when related classes are being held, so that classroom instruction can be integrated with worksite learning.

Youth apprentices may work *more* than the required minimum hours throughout the program as long as they do not exceed the daily or weekly hours allowable under the child labor laws.

Training to Competencies
The employer is responsible for providing the worksite training required to meet the skills standard competencies specified in the applicable IT area. This requirement means that while the youth apprentice may be hired under one particular job function, he/she must be allowed to rotate and perform other functions in other departments to meet competencies if some of them are not normally a part of that job function.

Mentors

Employers assign worksite mentors to supervise and train youth apprentices. They also allow the mentors to attend special training classes provided by the local YA consortium to become successful mentors of high school apprentices.
See "Role of Mentors" below for more detail.

Organized Labor

Usually the IT Youth Apprenticeship is considered an educational activity rather than a job classification/position status. However, the youth apprenticeship program should not impair existing contracts for services or collective bargaining agreements. Any youth apprenticeship program that would be inconsistent with the terms of a collective bargaining agreement shall be approved only with the written concurrence of the labor organization and employer involved. If youth apprentices will be working in areas covered by labor agreements, organized labor must be involved to approve the program at the worksite.
See *Appendix A* "*Work Contracts, Child Labor Laws, Liability & Insurance"* for more detail.

ROLE OF THE MENTOR

Workplace mentors are one of the most critical elements which often determine the success of a youth apprenticeship. One mentor may work with more than one youth apprentice at a worksite, and the mentor may assign multiple "trainers" to instruct the youth apprentice while they rotate among various departments.

Effective Mentor Qualifications.

➢ Experience working with adolescents either on the job, through family, or through outside activities
➢ Effective teaching/training skills with adults and/or youth
➢ Highly skilled in the area in which the youth apprentices will be trained
➢ Good communication skills in the workplace
➢ Knowledge of and commitment to the IT Youth Apprenticeship program

Mentor Responsibilities.

➢ Develop a cooperative training schedule for the youth apprentice to ensure performance of the required work-based skills
➢ Work with instructors to coordinate the application of classroom learning objectives to the worksite
➢ Communicate regularly with the school, YA coordinator, and the instructor to ensure work-based learning objectives are being met
➢ Demonstrate tasks to youth apprentices and explain their importance
➢ Identify other trainers appropriate to train youth in the required competencies

- Evaluate the youth apprentice's progress on a regular basis and document achievements and skills
- Meet with the student, the student's parent(s)/guardian(s), and school staff and/or YA instructor at least once each grading period to review and update them on the student's progress
- Provide encouragement, support, and direction about the work site culture and skills
- Help the youth apprentice build self-confidence and self-esteem
- Be alert to personal problems that may affect the apprentice's work performance and guide them to seek help from appropriate sources
- Attend mentor training workshops and mentor meetings

Obtain additional resources for mentoring guidance from your YA coordinator. Materials are also available through the Department of Public Instruction website.

CHECKLIST FOR PROGRAM PARTICIPATION

The following checklist will help you to participate in a IT Youth Apprenticeship (YA) Program. Youth Apprenticeship coordinators are available to meet at your location to facilitate any phase of the YA program.

- Discuss the IT YA program with the local partnership that offers Youth Apprenticeship Programs.
- Consult with the management team of your organization and union officials, if applicable.
- Obtain approval from appropriate organization officials to hire youth apprentices.
- Identify mentors and arrange for mentor training through your local YA Coordinator.
- Interview IT YA candidates for the program.
- Select youth apprentice(s).
- Sign Education/Training Agreement (ETA).
- Secure a Work Permit form.
- Orient your new youth apprentice to the workplace according to your organization's Human Resources policies.

CHECKLIST FOR PROGRAM OPERATION

The following checklist will help ensure continued operation of the IT Youth Apprenticeship (YA) Program.

- Provide worksite training according to the IT Youth Apprenticeship Area curriculum.
- Participate in progress reviews with youth apprentices, school staff and/or YA instructors, and parents/guardians.
- Meet regularly with the youth apprentices to discuss their performance and any other issues.
- Employ youth apprentices during school breaks, either part-time or full-time.

➤ Participate in recognition events organized by the school for youth apprenticeship graduates.

FREQUENTLY ASKED QUESTIONS

For questions not addressed here, do not hesitate to call your local youth apprenticeship coordinator or visit the Department of Workforce Development Youth Apprenticeship website.

How does this program differ from other work-based programs like coop education?
Skilled Certified Coop Education and Youth Apprenticeship are similar in that they are both components of Wisconsin's overall school to work transition programs. An important difference, however, is that Youth Apprenticeship students are exposed to an occupational cluster versus a specific job. Additionally, the skills the student learns are developed in association with Wisconsin IT personnel, Wisconsin technical college faculty, YA consortium coordinators, and school district coordinators/instructors. The curriculum is standardized throughout the state.

Will the mentor have to spend his/her entire time at work teaching the student?
No. Apprentices need to be supervised, but you are not required to "shadow" them at all times. However, someone should be available for guidance as necessary. One mentor may work with more than one youth apprentice at a worksite, and the mentor may assign multiple "trainers" to instruct the youth apprentice while they rotate among various departments.

Will the student do productive work?
Yes. After appropriate training, youth apprentices can become productive employees of the facility. However, since they are often rotated through different departments they will require more training time than employees who stay in the same department. It is important to remember that this is a training program. Upon completion of the probationary period, students are expected to meet the requirements of the position.

Will there be a lot of paperwork for me to complete?
Prior to the program, employers are required to sign the Education Training Agreement and maintain it. During the program, employers are expected to verify the youth apprentice's skills on the job and provide input during grading periods. Mentors must complete/maintain a simple "Skill Standards Checklist" as the student completes their competencies.

What happens if I cannot provide all of the required competencies at my facility?
In order to successfully complete the program and receive a Certificate of Occupational Proficiency, the youth apprentice must demonstrate proficiency in all areas required on the Skill Standards Checklist. If your facility does not provide the full range of services needed for competency mastery, the local youth apprenticeship coordinator may be

able to arrange for the missing skills to be provided by another company. This arrangement should be discussed with the coordinator before you hire the youth apprentice.

What costs will my business incur and will I be reimbursed?
Primary costs to the employers are the wages paid to the youth apprentice and mentor during the training period.

Will I have to treat the youth apprentice differently than my other employees?
It is important to remember youth apprentices are placed in your facility to learn. Patience and guidance are required while they learn responsible work habits as well as the required skills. However, they are expected to follow your facility's work rules, e.g., dress code, behavior, discipline, etc., and to become a productive member of the IT team.

What is the typical time frame for activities over the course of a youth apprentice's stay with a facility?
Most program activities follow a one-year or two-year cycle depending on the offerings within your company. There may be variance in the timing of learning activities to accommodate local and seasonal needs including trainer availability.

Appendix C

RECOMMENDATIONS FOR RELATED TECHNICAL CLASSROOM INSTRUCTION FOR INFORMATION TECHNOLOGY (IT) YA

These recommendations are intended to be used by the Local YA Consortium when determining appropriate related technical instruction for Information Technology (IT) YA. It is not all inclusive but should be used to assist the partnership with identification and/or development of course work that supports the work-based competencies as identified in the Skill Standards Checklist. As with all YA programs the consortium must ensure that the related instruction meets with the approval of their administration and school board.

OPERATIONAL NOTES

- Related Technical Classroom Instruction maybe offered by the employer, within the school district, at another school district, at a Wisconsin Technical College, and/or at a Community College or University by instructors qualified according to the Youth Apprenticeship Program Operations Manual.

- Commercial programs or Employer provided classroom certification programs are also appropriate provided that the student receives high school credit towards graduation for the class work. A variety of Computer Training and Certification courses are available locally and online. For the high school student just starting out in IT, the focus should be on the basic certifications. A small sampling of recognized courses include the following:
    - CompTIA A+ Certification (www.comptia.org)
    - Microsoft Office Specialist (www.microsoft.com/learning/en/us/certification/cert-overview.aspx)
    - CIW (Certified Internet Webmaster) Associate (www.ciwcertified.com/)
    - CISCO- CCENT (Entry Networking Technician) (www.cisco.com/web/learning/le3/le2/le45/learning_certification_level_home.html)

- Learning Objectives are the foundation of related technical classroom instruction. Consortiums may teach using locally developed coursework, however, it is recommended that agreements with the local technical college be pursued to obtain post-secondary credit for YA worksite and classroom experiences.

- A minimum of 180 hours (2 semesters) of related technical instruction is required for each one year YA program with 250 of the **work** hours coinciding with the instruction. The student must also receive high school credit towards graduation for this instruction, no matter the provider.

- It is suggested that an Introduction to IT Careers and a Computer Applications be provided as a pre-requisite for students interested in this youth apprenticeship.

Additionally, students should complete a job shadow prior to enrollment in the IT YA program.

- Courses chosen should coincide as much as possible to occupational program requirements if the student intends to continue in the Wisconsin Technical College System or University of Wisconsin system.

- Recommendations for this Appendix were obtained from Employers, the Wisconsin Department of Public Instruction, Wisconsin Technical College Faculty, YA Consortium/School District Coordinators during the IT YA Survey, August 2009, and through the States' Career Clusters recommendations at http://www.careerclusters.org/- Funded in part by the U.S. Department of Education.

Information Technology (IT) Youth Apprenticeship (YA) Plan of Study

NAME: _____ DATE: _____

The IT Youth Apprenticeship Pathway Units and Related Technical Instruction course selection and delivery are entirely within local consortium control. The recommendations listed below are only a suggested path of YA IT career planning and should be individualized to meet each learner's educational and career goals. All plans should meet high school graduation requirements, as well as, college entrance requirements if applicable.

HIGHLY Recommended for ALL IT YA students

Educational Level	Grade	English/ Language Arts 4 required	Social Studies Social Sciences 3 Required	Math 2 Required	Science 2 Required	Career Pathway Courses (Electives)	Recommended Enhancement Electives or Activities
Secondary	9	Oral Communications (Speech)				Keyboarding Computer Applications (MS Office)	Skills USA DECA or FBLA
	10	Business Communications				Business Concepts Computer Applications (MS Office)	Skills USA DECA or FBLA Job-Shadowing
	11			Computer Science Statistics		**IT Youth Apprenticeship - Level One or Two** • Employability Skills • Customer Service • Electronics (YA Hardware Pathway) • Computer Programming (YA Software Pathway) • Graphics (YA Web & Digital Media Pathway)	
	12		Economics				

Post-Secondary Occupational Opportunities

The chart below shows examples of career ladders organized by pathway.
For additional career cluster information, visit www.careerclusters.org
For additional career information on a specific occupation, visit http://wiscareers.wisc.edu/ or http://worknet.wisconsin.gov/worknet/default.aspx

		High School Diploma, On-the-Job Training	Certificate, Licensing, and/or Associate's Degree (1-2 years college)	Bachelor's/Master's Degree (4 year college)
Information Technology (IT) Pathways	Network Systems	User Support Technician	Network Specialist Telecommunications Technician User Support Specialist	IS Administrator Network Administrator Network Systems Analyst Telecommunications Engineer
	Information Support and Services	Computer Operators Technical Support Specialist	Computer Hardware Technician Computer Service Technician Computer Support Technician Help Desk Support Specialist PC Support Specialist	Computer Security Specialist Database Administrator Data Communications Analyst Operations Research Analyst
	Web & Digital Communicatio ns	Web Designer	e-Commerce Technician Social Networking Specialist Webmaster Website Developer	Web Administration Web Developer
	Programming & Software Development	Software Tester	Programmer/Analyst Simulation and Gaming Programmer	Computer Programmer Software Applications Engineer Systems Analyst

SOURCES: The States' Career Clusters Initiative, 2009, www.careerclusters.org; Worknet, 2009, http://worknet.wisconsin.gov/worknet/default.aspx, Waukesha County Technical College (WCTC), Susan Maresh, Waukesha County School-to-Work, 2007.

Appendix D

WISCONSIN INSTRUCTIONAL DESIGN SYSTEM (WIDS) FORMAT AND YOUTH APPRENTICESHIP PROGRAM GUIDE TERMS

WIDS/YA Program DOCUMENTS:

Course Outcome Summary (COS)
> The list of *competencies* and corresponding *performance standard criteria, conditions, and Learning Objectives* required for competency mastery

Information Technology (IT) YA Program Guide
> Description of the Information Technology (IT) YA Program. In WIDS, this information is located in the Program Outcome Summary (POS)

Skill Standards Checklist
> Listing of ALL the competencies in ALL of the industry-wide and industry-specific skill areas. The checklist provides the overall documentation for DWD of the skill achievement levels for the competencies in the specific units.

WIDS TERMS:

Competency
> The major skill or outcome stated in observable, measurable terms telling learners what they must be <u>able to do</u> AFTER a learning experience.

Performance Standards
> Specifications by which performance of a competency will be evaluated (criteria) and the circumstances/situation (condition) in which the competency will be evaluated.

Core Skills
> Competencies that address the abilities, values, and attitudes required for productive and successful employment.

Learning Objective
> The background knowledge that is needed in order to master the competency; the related technical classroom instruction information needed by the learner to master the competency.

Appendix E

USE AND DISTRIBUTION OF THE CURRICULUM

New and current employers should be given at least one set of the complete curriculum package. The curriculum package includes a copy of the **Program Guide**, **Skill Standards Checklist**, and the **Course Outcome Summary (COS).** In particular, the performance standards on the COS should be highlighted with the employer mentor(s) so that they know HOW to assess the learner for competency evaluation.

All related technical classroom instructors will need to be provided with the **Course Outcome Summary (COS**) in order to see the Learning Objectives for the related technical classroom instruction. The local Information Technology (IT) Youth Apprenticeship advisory group should determine the requirements and delivery of the required related technical classroom instruction *prior to* offering this YA program in the local consortium area. The advisory group should ensure that each learning objective is being taught either at the employer facility, school, and/or technical college.

At the beginning of the IT YA program, student learners should receive a copy of the **Skill Standards Checklist** and the applicable pages from the **Course Outcome Summary (COS)** to review with their instructor(s) and worksite mentor(s). This is the opportunity for instructors and mentors to highlight the worksite experiences, related technical classroom instruction, and assessments that will occur. In a performance-based curriculum successful learning is enhanced when the learners have the opportunity to review what will be expected of them in advance of the lessons.

It is recommended that a portfolio be prepared for EACH learner. The learner should be given the responsibility for maintaining this documentation and making it available to the instructor and/or worksite mentor for recording performance assessments.

When the performance criteria are completed successfully, the learner achievement level information must be recorded on the **Skill Standards Checklist**. A copy of the completed Skill Standards Checklist is the piece of documentation required by DWD in order to issue the Certification of Occupational Proficiency.

Appendix F

POST SECONDARY CREDITS

Wisconsin Technical College System

Graduates of one-year or two-year Information Technology (IT) Youth Apprenticeship programs may be awarded credits in Wisconsin Technical College programs. Each Technical College may grant credit through specific local articulation agreements. Contact the local technical college to determine the number and type of articulated credits available for IT YA. The credits may be taken as technical college courses within Youth Apprenticeship programs or may be granted through advanced standing agreements when students enroll in the technical college.

In addition, YA students should request a credit evaluation of their YA classroom and work experiences upon admission to the local technical college under the Wisconsin Technical College System "Credit for Prior Learning Policy" #323.

UW Institutions Credits for *Admission* –

Admission Credits for the Information Technology (IT) Youth Apprenticeship Program are yet TO BE DETERMINED.

Appendix G

GRANDFATHER CLAUSE – PROGRAM TRANSITION GUIDELINES

For NEW and CONTINUING Information Technology (IT)
YA Students

- If the student begins IT YA using the OLD checklist, then the student must complete the YA program using the OLD checklist. The appropriate Level One or Level Two Certificate of Occupational Proficiency from the Wisconsin Department of Workforce Development (DWD) will be awarded.

- Senior graduating in 2011 **Level One** YA: The youth apprentice may complete either an OLD checklist OR use the revised IT YA checklist. The appropriate Level One Certificate of Occupational Proficiency from the Wisconsin Department of Workforce Development (DWD) will be awarded.

- Senior graduating in 2011 **Level Two** YA: The youth apprentice completes the OLD checklist for the year 2 curriculum for IT- Computer Science or IT- Networking YA. An appropriate Level Two Certificate of Occupational Proficiency from the Wisconsin Department of Workforce Development (DWD) will be awarded.

- Junior in 2010-2011, **Level One** YA: The youth apprentice may complete either an OLD checklist or use the revised IT YA checklist. The appropriate Level One Certificate of Occupational Proficiency from the Wisconsin Department of Workforce Development (DWD) will be awarded for the Junior year participation in the YA program.

- Junior in 2010-2011, **Level Two** YA: The youth apprentice starts either the OLD checklist or uses the revised IT checklist, however, the youth apprentice must complete the YA program using the same checklist the 2nd year, their Senior year. The appropriate Level Two Certificate of Occupational Proficiency from the Wisconsin Department of Workforce Development (DWD) will be awarded.

- Sophomore applying for the IT YA Program for 2011-2012: New youth apprentices must use the revised IT YA checklist **by the 2011-12** school year. A Certificate of Occupational Proficiency will not be issued to students who submit the old checklist.

NOTE: Additionally, Youth Apprenticeship students must maintain good academic standing and be on track for graduation to be eligible for a Certificate of Occupational Proficiency from the Department of Workforce Development.

Appendix H

**INFORMATION TECHNOLOGY (IT)
YOUTH APPRENTICESHIP**

SKILL STANDARDS CHECKLIST

http://dwd.wisconsin.gov/dwd/forms/dws/detw-16812-e.htm

(DOWNLOAD MOST RECENT)

dwd.wisconsin.gov/youthapprenticeship/skills_checklists.htm

Appendix I

**INFORMATION TECHNOLOGY (IT)
YOUTH APPRENTICESHIP**

**COURSE OUTCOME SUMMARY:
OVERVIEW AND TABLE OF CONTENTS**

Information Technology (IT) Youth Apprenticeship
Course Outcome Summary

Course Information

Organization	Center for Career Development & Employability Training (CCDET)- University of Wisconsin- Oshkosh
Developers	Robin Kroyer-Kubicek
Development Date	

Description

This curriculum describes the performance-based worksite Competencies, Performance Standards, and Learning Objectives for the Wisconsin Youth Apprenticeship (YA) Program in Information Technology (IT). The Wisconsin IT YA Program is designed to provide students with a working understanding of core industry skills and occupationally specific technical skills that serve as the standard for occupations in the IT industry. This program provides the framework for educators and industry to work together to produce work-ready, entry-level employees that will compete favorably in a global market, as well as, provide for post-secondary educational advancement while integrating work-based learning in the school and worksite.

The Information Technology (IT) competencies are aligned with the learning objectives in the CISCO IT Essentials program (http://www.cisco.com/web/learning/netacad/course_catalog/IT1.html), and the standards and knowledge statements outlined in the National States' Career Cluster Skill Standards (http://www.careerclusters.org/) of the four IT Pathways; Network Systems, Information Support & Services, Web & Digital Telecommunications, Programming & Software Development. IT YA students are required to perform all of the Core and Safety & Security skills for EACH pathway they enroll in. **Level One (one year)** IT YA students are also required to complete additional competencies in a minimum of one unit. **Level Two (two year)** IT YA students are to choose another specific unit based on their area of interest and their worksite placement.

EACH competency (work site skill) is listed with its corresponding Performance Standards and Learning Objectives. The Performance Standards describe the behaviors, *as applicable*, that employers should look for in order to evaluate the competency. The Learning Objectives describe the classroom learning content for the required related technical instruction.

Curriculum Sources

- Boston Area Advanced Technological Education Connections (BATEC) Draft Model IT Core Learning Curriculum presented at the National Career Pathways Network Conference October 1, 2009.

- CISCO Networking Academy, IT Essentials: PC Hardware and Software v4.0. 2006.

- Dane County YA Consortium meeting with IT professionals regarding YA students and curriculum. Meeting September 18, 2009.

- Fox Valley Technical College, Advisory Committee Meeting discussion and handouts regarding change to existing core courses for IT Core Curriculum. Meeting October 13, 2009.

- Madison Area Technical College Advisory Committee Meeting discussion and handouts regarding change to Help Desk Topics and Courses. Meeting November 6, 2009.

- National Standards for Business Education, Information Technology obtained from Wisconsin Department of Public Instruction, September 2009.

- Reuscher, D. (2009). "Computer Certification: Top 10 Certifications to Begin your IT Career," About.com, www.about.com. Accessed July 21, 2009.

- States' Careers Clusters, Information Technology Career Cluster Knowledge and Skills charts for Network Systems, Information Support & Services, Web & Digital Telecommunications, and Programming & Software Development. http://www.careerclusters.org/. Accessed July 2009.

- U.S. Department of Labor, Employment and Training Administration. Information Technology Building Blocks for Competency Model. www.doleta.gov. Accessed September 2, 2009.

- Walker, M. (2008). "Certification at the Entry Level," Certification Magazine, www.certmag.com. Accessed July 21, 2009.

- Wisconsin Administrative Code, Department of Workforce Development, Chapter 270, Child Labor, and Wisconsin State Statutes Chapter 106, Apprentice, Employment and Equal Rights Program, June 2, 2007.

- Wisconsin Department of Public Instruction, Business Skill Standards Co-op for Information Technology. September 2009.

- Wisconsin Department of Workforce Development IT Youth Apprenticeship Survey dated July 2009, and the subsequent Advisory Committee, formed September 2009 for the purpose of revising and updating the Youth Apprenticeship curriculums.

- Wisconsin Department of Workforce Development, Information Technology- Computer Science and Information Technology- Networking Youth Apprenticeship curriculum dated November 1999.

- Worknet Occupation Task Lists for Computer Systems Analysts, Computer Software Engineers- Applications & Systems Software, Computer Programmers, Computer Operators, Computer Support Specialists, Database Administrators. http://worknet.wisconsin.gov/worknet/default.aspx. Accessed December 2009.

Table of Contents

APPENDIX J: Required Skills

Unit 1: Core Skills

 1. Apply applicable academic knowledge
 2. Apply applicable career knowledge
 3. Communicate effectively
 4. Communicate effectively on the phone
 5. Act professionally
 6. Demonstrate customer service skills
 7. Cooperate with others in a team setting
 8. Think critically
 9. Exhibit regulatory and ethical responsibilities
10. Use basic technology
11. Use resources wisely

Unit 2: Safety & Security

 1. Follow personal safety requirements
 2. Maintain a safe work environment
 3. Demonstrate professional role in an emergency
 4. Follow security procedures
 5. Maintain confidentiality

APPENDIX K:

Unit 3: General IT Pathway: IT Essentials

 1. Apply applicable IT industry knowledge
 2. Schedule appointments
 3. Process customer requests
 4. Query, view, and extract data
 5. Perform common technical requests
 6. Assist to resolve customer problems
 7. Perform basic back up procedures
 8. Monitor systems to ensure optimal functioning
 9. Prepare required reports
10. Install a desktop system and peripheral equipment
11. Install & configure an operating systems (O/S) and/or drivers
12. Upgrade an operating system (O/S)
13. Install and uninstall an application
14. Install operating system (O/S) service packs and security patches
15. Ghost a computer
16. Participate on a system project team

APPENDIX L:

Unit 4: Network Systems and Information Support & Services Pathway: Hardware Unit

  1. Maintain network records
  2. Communicate with vendors
  3. Perform basic technical network support duties
  4. Assist to monitor network performance
  5. Perform routine network system maintenance
  6. Assist to apply network upgrades, service packs, and patches
  7. Upgrade portable devices
  8. Replace inoperable computer components
  9. Assist to troubleshoot network system and data communication problems
  10. Assist to install or upgrade network equipment
  11. Participate on a networking systems evaluation project team

APPENDIX M:

Unit 5: Programming & Software Development and Information Support & Services Pathway: Software Unit

  1. Use basic office software applications
  2. Assist to maintain database security measures
  3. Monitor and maintain data integrity
  4. Assist to troubleshoot supplication and database problems
  5. Create a database
  6. Acquire and install new software
  7. Assist to test software programming changes or modifications
  8. Evaluate application software packages
  9. Write Code
  10. Participate on a software development or customization project team

APPENDIX N:

Unit 6: Web & Digital Communications Pathway: Web & Digital Media Unit

  1. Maintain web/digital media production and progress records
  2. Assist to outline structural content
  3. Assist to create verbal content
  4. Create or edit images and graphics for website/digital media use
  5. Create templates for website layout
  6. Write program code for a website
  7. Assist to create specialized scripts/motion graphics
  8. Perform user testing
  9. Assist to finalize a website
  10. Assist to maintain a website
  11. Participate on website/digital media project team

Appendix J

INFORMATION TECHNOLOGY (IT) YOUTH APPRENTICESHIP

REQUIRED SKILLS CURRICULUM UNITS 1-2

Unit 1: Required Skills
Core Skills

Competency
1. Apply applicable academic knowledge

Performance Standard Condition
Competence will be demonstrated
- at the worksite and classroom

Performance Standard Criteria
Performance will be successful when the learner:
- Reads and comprehends work related materials
- Applies mathematical operations involving whole numbers, fractions, decimals, percentages, formulas and methods of measurement accurately when necessary
- Interprets charts, tables, and graphs

Learning Objectives
 MATH
- Add, subtract, multiply, and divide whole numbers, fractions, decimals and percents
- Calculate averages, ratios, proportions, and rates
- Convert decimals to fractions, fractions to percents and vice versa
- Measure and accurately report measurements of time, temperature, length, width, height, width, perimeter, area, volume, and weight
- Use appropriate formulas
- Convert measurements correctly (e.g., English (standard) to metric)
- Interpret meaning from data
 ENGLISH
- Use standard English to compile information and prepare written reports
- Apply English language correctly (spelling, grammar, structure)
- Derive meaning from text through summarizing
- Discern meaning from written word
- Use acceptable language
- Write legibly
 SCIENCE
- Compare and contrast subjective and objective information

Comments:

Unit 1: Required Skills
Core Skills

Competency
2. Apply applicable career knowledge

Performance Standard Condition
Competence will be demonstrated
- at the worksite and classroom

Performance Standard Criteria
Performance will be successful when the learner:
- Demonstrates understanding of career development in the IT industry
- Obtains necessary skills and knowledge to meet position requirements

Learning Objectives
- Explain the process for seeking employment
- Describe the major functions and duties of the career pathways within the IT career cluster
- Discuss educational, training, and credentialing requirements for a selected job
- Research job requirements and characteristics of a selected job
- Contrast "positive" and "less positive" aspects of a selected job
- Describe opportunities for advanced training in IT

Comments:

Unit 1: Required Skills
Core Skills

Competency
3. Communicate effectively

Performance Standard Condition
> **Competence will be demonstrated**
> • at the worksite and classroom

Performance Standard Criteria
> **Performance will be successful when the learner:**
> • Delivers coherent verbal messages in words that can be understood
> • Uses appropriate and bias-free language
> • Uses appropriate body language
> • Listens actively to others
> • Demonstrates courtesy with self-introduction
> • Responds to inquiries or statements within the scope of current responsibilities and understanding
> • Does not provide confidential information without appropriate authorization
> • Does not overreact in response to anger
> • Records information in a timely manner
> • Records written information legibly and accurately
> • Organizes and compiles messages, technical information, and summaries accurately
> • Uses email, the Internet, printer, copier, scanner, and fax machine equipment appropriately as applicable
> • Is sensitive to special, multicultural, and/or multilingual needs
> • Utilizes alternative communication services to assist customers with specialized needs

Learning Objectives
GENERAL
• Explain the importance of clear and understandable communication
• Describe verbal and nonverbal behaviors that might inhibit communication
• Explain how empathy and bias can be communicated verbally & non-verbally
• Describe the impact of non-verbal communication
• Explain ways to improve communication
LISTEN
• Discuss effective and active listening skills
• Differentiate between hearing and listening
• Evaluate different styles of listening
• Identify the effects of physical, social, and psychological factors on ability to listen
WRITTEN
• Discern meaning from written instructions
• Write clearly to communicate written ideas such as for business letters, journals, newsletters, or articles
• Discuss common recording errors and how to avoid them
CUSTOMER

- Identify internal and external customers at your facility
- Discuss steps to assess customer understanding
- Explain communication strategies to be used with a diverse customer and coworker population
- Describe the steps to follow when dealing with complaints

SPECIAL
- Discuss methods to accommodate for communication with special needs customers/clients

TOOLS
- Describe technology used in communicating such as, telephone, texting, instant messaging (IM), computers, fax, intercom, beepers, tube systems, etc.
- Explain the proper use and etiquette required for these forms of communication technology
- Review the policies and procedures for using written communication tools in your company such as email, Internet, printer, copier, scanner, and/or fax

Comments:

Unit 1: Required Skills
Core Skills

Competency
4. Communicate effectively on the phone

Performance Standard Condition
> **Competence will be demonstrated**
> • at the worksite and classroom

Performance Standard Criteria
> **Performance will be successful when the learner:**
> • Answers the telephone promptly
> • Follows company guidelines for identifying self
> • Greeting is pleasant and courteous
> • Determines purpose of call
> • Transfers call to appropriate individual when necessary
> • Listens carefully to caller before giving any response
> • Does not provide confidential information without appropriate authorization
> • Uses appropriate language
> • Minimizes the time caller is put on hold
> • Ends conversation with courteous closure
> • Records telephone conversation and/or takes messages accurately

Learning Objectives
• Explain how to use the telephone in your company to place callers on hold and to transfer calls
• Describe voice qualities that convey pleasantness
• Describe the proper telephone answering procedure
• Discuss the potential for violating customer confidentiality during telephone conversations
• List the types of questions or information received from a telephone call which should be referred to the worksite professional
• Emphasize the importance of accuracy in taking telephone messages
• Detail some uses of the company telephone which would be considered unethical
• Explain the appropriate way(s) of bringing closure to a telephone conversation
• Describe the use of telephone documentation/logs required by some departments/facilities

Comments:

Unit 1: Required Skills
Core Skills

Competency
5. Act professionally

Performance Standard Condition
Competence will be demonstrated
- at the worksite and classroom

Performance Standard Criteria
Performance will be successful when the learner:
- Follows oral and written instructions
- Is pleasant, courteous, and professional with coworkers and internal and external customers
- Appearance and dress are appropriate according to the requirements of the employer
- Takes personal responsibility for attendance
- Is punctual
- Begins work promptly
- Organizes and prioritizes tasks efficiently
- Exhibits positive attitude and commitment to task at hand
- Completes assigned tasks accurately and in a timely manner
- Takes responsibility for actions and decisions
- Recognizes lack of knowledge and seeks help from information sources
- Evaluates work goals periodically with worksite professional
- Accepts constructive criticism and applies suggestions
- Communicates safety, training, and job-specific needs
- Adheres to safety rules and regulations

Learning Objectives
- Locate and explain written organizational policies, rules and procedures to help employees perform their jobs
- Locate and explain your company's employee manual for policies on Appearance, Breaks, Time Off, Cell Phone Use, Weather, Personal Issues, etc.
- List qualities of successful IT employees
- Describe how you can demonstrate enthusiasm and commitment at the worksite
- Define initiative
- Explain ways that you can show initiative at a worksite
- Explain methods to evaluate work assignments and prioritize them
- Describe how to effectively receive feedback
- Identify ways in which honesty and integrity of co-workers affect work performance

Comments:

Unit 1: Required Skills
Core Skills

Competency
6. Demonstrate customer service skills

Performance Standard Condition
Competence will be demonstrated
- at the worksite and classroom

Performance Standard Criteria
Performance will be successful when the learner:
- Is knowledgeable about products and services
- Addresses the customer, either in person, by telephone, e-mail or other means
- Gathers information about customer's needs, and customer's knowledge of products or services
- Responds to customer's comments and questions
- Solicits supervisor or co-worker support and advice when necessary to meet customer needs
- Coordinates as needed with other services to expedite delivery of service or product
- Handles complaints tactfully without insult or conflict
- Provides feedback to management to enhance operations

Learning Objectives
- Define customer service.
- Identify internal and external customers at your facility
- Describe how customer service affects a company's "bottom line"
- Describe standards of service
- Evaluate customer service scenarios
- Determine appropriate customer service solutions
- List strategies for maximizing customer satisfaction
- Describe the functions of other departments or units to serve the customer
- Describe the steps to follow when dealing with complaints
- Identify customer service methods to use when encountering an angry customer
- Review material pertaining to products and services produced by your department or company

Comments:

Unit 1: Required Skills
Core Skills

Competency
7. Cooperate with others in a team setting

Performance Standard Condition
Competence will be demonstrated
- at the worksite and classroom

Performance Standard Criteria
Performance will be successful when the learner:
- Demonstrates respect relating to people
- Contributes to a group with ideas, suggestions, and effort
- Listens and responds appropriately to team member contributions
- Works collaboratively with people from other backgrounds/cultures
- Resolves differences for the benefit of the team
- Completes their share of tasks necessary to complete a project

Learning Objectives
- Explain the functions of each department or unit within the larger organization
- Compare teams and groups
- Identify roles found in teams such as leader, facilitator, recorder, etc.
- List effective meeting management skills
- Demonstrate techniques which show respect for others
- Explain how empathy and bias can be communicated verbally & non-verbally
- Describe how to effectively give and receive feedback
- Discuss effective and active listening skills
- Describe conflict resolution methods
- Discuss ways to foster group communication and productivity
- Discuss ways to participate within a team setting
- Explain how to interact appropriately with diverse ethnic, age, cultural, religious, and economic groups in different situations
- Describe how work teams coordinate work flow and help manage resources

Comments:

Unit 1: Required Skills
Core Skills

Competency
8. Think critically

Performance Standard Condition
Competence will be demonstrated
- at the worksite and classroom

Performance Standard Criteria
Performance will be successful when the learner:
- Recognizes the existence of a problem
- Applies problem-solving steps
- Differentiates between fact and opinion
- Considers other viewpoints and perspectives
- Applies the principles and strategies of organized thinking
- Evaluates information, ideas, and problems
- Collects information through probing questions and research
- Defines the problem
- Uses techniques such as brainstorming to acquire alternative solutions
- Demonstrates comparison skills
- Makes decisions based on analysis
- Presents ideas for critical evaluation
- Supports viewpoints with evidence

Learning Objectives
- Explain different techniques for problem solving such as the 5 step problem solving cycle or Deming's 14 step problem solving cycle
- Describe how to break a problem down in order to brainstorm, evaluate, and analyze possible solutions
- Discuss the difference between fact and opinion
- Discuss data collection techniques for the problem solving process
- Apply logical reasoning to analyzing problems and solutions
- Identify opportunities for applying problem solving skills
- Practice different problem solving situations
- Describe how to present a solution with evidence
- Explain ways to reach a decision by consensus
- Develop and implement a problem-solving strategy
- Discuss methods to evaluate a solution that has been implemented

Comments:

Unit 1: Required Skills
Core Skills

Competency
9. Exhibit regulatory and ethical responsibilities

Performance Standard Condition
Competence will be demonstrated
- at the worksite and classroom

Performance Standard Criteria
Performance will be successful when the learner:
- Follows all safety and worksite standards and regulations including those required by the Occupational Safety & Health Administration (OSHA) and the Environmental Protection Agency (EPA)
- Performs legally and ethically by all local, state, and national standards
- Complies with legal requirements for documentation
- Stays current with compliance issue legislation and standards
- Uses email, the Internet, printer, copier, scanner, and fax machine equipment appropriately and correctly as applicable
- Operates within scope of authority adhering to company rules, regulations, and policies as established in employee handbook/procedures
- Documents work processes as required
- Records and files appropriate legal reports in timely manner
- Maintains confidentiality of company, customer, and co-worker information
- Documents reportable incidents to worksite professional immediately, if applicable
- Receives, handles, packages, and ships materials and product according to shipping laws and regulations if applicable

Learning Objectives
 GENERAL
- Explain the role of the government in regulating and managing the IT industry
- Compare national, state and local regulators that oversee the IT industry
- Compare the following Federal regulatory agencies and their laws on the IT industry: Federal Communications Commission (FCC), Department of Homeland Security, Department of Commerce.
- Identify the management structure and employees' roles within your organization
- Describe common legal requirements that must be met in IT facilities
- Describe your legal responsibilities, limitations, and implications for action in your job role
- Identify the rules and regulations of the company as they relate to the employee
- Identify penalties for regulation non-compliance
- Compare and contrast behaviors and practices that could result in liability or negligence
- Explain legal issues faced by IT professionals
- Summarize the rights and responsibilities of IT workers
- Explain what situations are reportable in IT facilities
 ETHICAL
- Explain the difference between an ethical practice and a legal responsibility

- Identify ethical issues common to the IT field
- Describe ethical work values such as confidentiality, productivity during the day, following safety standards

SAFETY
- Define legal and ethical responsibilities for safety procedures
- Describe the certification/license requirements to operate specific equipment or perform specific functions

RECORDS
- Identify the main functions of documents and documentation
- Identify the guidelines for retaining common documents

Comments:

Unit 1: Required Skills
Core Skills

Competency
10. Use basic technology

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite and classroom

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Uses communication technology (such as pagers, radios, phone, fax, email, Internet) to access and distribute data and other information within the scope of the job
> - Follows rules for proper computer and communication technology usage
> - Uses calculating tools such as a computer, calculator, and adding machine correctly
> - Enters, edits, and stores data on computerized equipment according to worksite guidelines
> - Verifies data entry prior to data storage or equipment operation

Learning Objectives
- Identify the parts and functions of a computer system using correct terminology including the keyboard, monitor, mouse, printer
- Point out the storage device locations on the computer such as the Hard drive, Floppy drive, CD-ROM drive, and Portable File Storage drive, etc
- Show the appropriate connections and positioning of peripheral devices such as a mouse, keyboard, monitor, and printer
- Discuss the importance of backing up computerized files
- Compare communication technologies (phone, email, texting, instant messaging) and their uses in a business setting
- Describe how to evaluate internet web sites and information for validity and reliability
- Explain appropriate and inappropriate uses of email and internet while at work
- Describe how to develop effective presentations using appropriate technologies (e.g., tables, charts, and visual graphics)
- Explain the use of writing/publishing/presentation applications
- Describe how database and spreadsheet technology is used at your worksite to manage worksite operations

Comments:

Unit 1: Required Skills
Core Skills

Competency
11. Use resources wisely

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite and classroom

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Follows the facility pollution/waste prevention plan
> - Chooses most appropriate and efficient sources of energy
> - Recycles whenever possible
> - Disposes of materials appropriately
> - Disposes of hazards legally and with regard to environmental impact

Learning Objectives
- Identify environmental issues affecting the IT industry
- Determine effects of environmental issues on the IT industry
- Define what is meant by making "green" choices
- Compare renewable and nonrenewable natural resources
- Explain the meaning of sustainable resources use
- Identify practices that contribute to sustainability
- Describe your responsibility to a global environment
- Describe why wise use of resources at the worksite is important
- Give examples of wasteful uses of resources (unnecessary waste and duplication) at the worksite
- Explain how your choices of resources impact your department, your facility, your environment and the planet
- List materials that can be recycled
- Describe recycling methods
- Describe materials that require special disposal
- Explain purpose of pollution control systems
- Relate power generation to energy sources
- Compare environmental impact of energy sources
- Compare characteristics of energy sources (e.g., fuel cells, chemical, wind, hydro, nuclear, electric, mechanical, solar, biological)

Comments:

Unit 2: Required Skills
Safety & Security

Competency
1. Follow personal safety requirements

Performance Standard Condition
 Competence will be demonstrated
  • at the worksite

Performance Standard Criteria
 Performance will be successful when the learner:
  • Participates in all required safety training
  • Follows all worksite guidelines for personal safety
  • Applies principles of proper body mechanics when necessary
  • Reports any exposures, injuries, or accidents, personal or to others, immediately, if applicable
  • Locates and can find key information on Material Safety Data Sheets (MSDS)
  • Handles and disposes of any hazardous materials appropriately, if applicable
  • Operates only equipment that he/she is trained on
  • Adheres to equipment safety standards
  • Visually inspects equipment to ensure safety compliance and function before operation
  • Wears the required Personal Protective Equipment (PPE) at all times as required by the worksite for specific tasks

Learning Objectives
• Discuss the regulatory purpose and responsibility of the Occupational Safety and Health Administration (OSHA)
• List your rights as a worker according to OSHA
• Explain the procedure to follow in case of an exposure, injury, or accident to self or to another
• Explain ways your company prevents accidents
• List engineering controls that are taken to protect workers from accidents
• Describe safe and unsafe work habits and their implications
• List safety hazards common in your facility
• Explain potential hazards associated with blood borne pathogens
• Explain the ergonomic impact of work techniques
• Describe proper techniques for lifting loads
• Describe the Material Safety Data Sheet (MSDS) and its purpose
• Discuss the procedures of handling & disposing of hazardous material
• List mechanical, chemical, electrical, compressed air, and equipment safety hazards at your facility
• Explain how Lock Out/Tag Out procedures prevent accidents
• Define the Personal Protective Equipment (PPE) required for specific tasks in your facility
• Explain the use of safety equipment such as eyeball washers and chemical safety showers and when you would use them
• Explain the safe use of ladders

- Describe ways to prevent burns
- Demonstrate safe use of equipment you will commonly use

Comments:

Unit 2: Required Skills
Safety & Security

Competency
2. Maintain a safe work environment

Performance Standard Condition
Competence will be demonstrated
  • at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
  • Complies with posted safety warnings and symbols
  • Identifies unsafe conditions and/or work habits and reports them to the worksite professional immediately, if applicable
  • Helps maintain a clean and safe working environment free of debris and obstacles
  • Cleans, organizes, puts away items in the work area
  • Safely identifies, handles, stores, and uses hazardous materials according to company procedure, if applicable
  • Reports any indications of insects or pests

Learning Objectives
  • List the major components of a facility safety program
  • List the different state and federal agencies that provide regulatory oversight at your facility for personal safety, environmental safety, and equipment safety
  • List accident and fire prevention techniques
  • Describe posted safety warnings and symbols and what they mean
  • Describe safe and unsafe work habits and their implications
  • Discuss the importance of keeping the work area and tools/equipment clean
  • List mechanical, electrical, and equipment safety hazards at your facility
  • Discuss how to identify and report unsafe conditions in your facility
  • Discuss safety procedures to prevent accidents
  • Describe the requirements at your facility for safety training and auditing
  • Assess need for good housekeeping practices
  • List accident and fire prevention techniques
  • List hazards that contribute to injury due to slips, trips, or falls
  • Outline compliance requirements of sanitation and health inspections

Comments:

Unit 2: Required Skills
Safety & Security

Competency
3. Demonstrate professional role in an emergency

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Participates in emergency safety simulations and drills
> - Outlines the company's policy and procedure for worksite incidents, accidents, electrical, fire, tornado, bomb threats, robbery, hostage situations, and other emergency situations
> - Identifies the closest fire alarms and emergency exits in the assigned worksite area
> - Identifies the fire extinguishers in the assigned worksite area
> - Identifies appropriate alarms and procedures for using alarms
> - Contacts emergency personnel according to company requirements in the event of an emergency
> - Documents any emergency incidents according to company requirements

Learning Objectives
- Describe the procedures in your company to report an emergency
- Review your company procedures for responding to exposures, injuries, accidents, spills, fire, tornado, bomb threat, robbery, hostage situations, etc.
- Demonstrate how to use the fire extinguisher
- Explain the evacuation plan for the worksite
- Indicate the demeanor necessary during an emergency
- Identify methods to cope with emergency situations
- Name the resources for assistance in crimes or accidents
- Locate and explain use of first aid emergency care kits
- Detail steps to use in medical emergencies requiring First Aid, CPR, and/or Heimlich maneuver
- Locate and explain use of spill kits, if applicable to worksite
- Explain who in your facility can give first aid care in the event of an emergency
- Explain the local protocols in place with local law enforcement
- Explain the role of the Hazardous Materials (HAZMAT) team
- Detail how to access help in a robbery or terrorist situation
- Explain the use of safety equipment such as eyeball washers and chemical safety showers and when you would use them

Comments:

Unit 2: Required Skills
Safety & Security

Competency
4. Follow security procedures

Performance Standard Condition
Competence will be demonstrated
- at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
- Follows facility measures to protect confidential data
- Maintains customer and employee security procedures
- Implements security countermeasures as required
- Documents any security procedures taken

Learning Objectives
- Describe potential security threats to information systems
- Define basic security measures for ensuring data integrity, accidental data disclosure, unauthorized access and inappropriate use
- Describe how user identity is checked for access
- Identify the range of security needs and the problems that can occur due to security lapses
- Outline how access to hardware and data is controlled
- Define a virus, Trojan, worm, etc.
- Explain the use of virus/computer protection strategy
- Discuss security procedures and their impact on business ethics

Comments:

Unit 2: Required Skills
Safety & Security

Competency
5. Maintain confidentiality

Performance Standard Condition
Competence will be demonstrated
- at the worksite and classroom

Performance Standard Criteria
Performance will be successful when the learner:
- Does not provide confidential information without appropriate authorization
- Safeguards the confidentiality of data, customer records and personal information per requirements
- Complies with legal requirements for confidentiality

Learning Objectives
- Discuss legal regulations pertaining to privacy and security such as the USA Patriot Act
- Identify penalties for regulation non-compliance
- Describe how a customer's identity is confirmed
- Describe methods used to prevent and detect identity theft
- Explain legal issues involved in a company security policy
- Identify legal issues involved concerning a security breach

Comments:

Appendix K

INFORMATION TECHNOLOGY (IT)
YOUTH APPRENTICESHIP

GENERAL IT PATHWAY
IT ESSENTIALS
UNIT 3

Unit 3: ALL Pathways
IT Essentials

Competency
1. Apply applicable IT industry knowledge

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
> - ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Demonstrates IT systems understanding based on ***current training and learning***
> - Navigates the basic operating system
> - Manages electronic files and folders

Learning Objectives
  SYSTEMS, PRINCIPLES, CONCEPTS
- Define Information Technology (IT) and Information Systems (IS)
- Compare IT to IS
- Describe the life cycle of an information system
- Describe the various components of the IT industry
- Explain the importance of the IT industry in meeting human needs
- Explain how hardware and software communicate to accomplish tasks
- Describe elements and types of information processing
- Identify the elements of the information processing cycle (i.e., input, process, output, and storage)
- Compare internet based computing models (such in as cloud computing) to standard computing models
  TERMS
- Discuss the different file extension codes and their meanings such as .exe, .ini, .doc, .jpg, .gif, .txt, .dll, etc.
- Define common terms and acronyms used in the IT industry such as:
- PC, monitor, CRT, LCD, port, peripherals, portable devices, PDA
- Hard drive, driver, interface, CPU, O/S, BIOS
- Memory, RAM
- Boot, format, configure, upgrade, file, partition
  COMPONENTS
- Identify types of computing platforms and how they process information
- Explain the purpose of the following computer components and how they work together as a system:
- Motherboard/CPU
- Chipsets/BIOS and their drivers
- Memory modules (RIMM, Dimm, SDRAM, DDR, DDR2, etc)

- Hard drive technologies (IDE, EIDE, SATA, SCSI, etc)
- Video cards and slots (VGA, XVGA, VESA, SLI, etc)
- I/O ports (serial, parallel, USB, PS/2, Firewire, etc)
- Modem/NIC ports
- INPUT devices (keyboard, mouse, touchpad, cameras, scanners, midis, barcode scanners, etc)
- OUTPUT devices (printers, CRTs, LCD monitors, network devices)
- PDAs and Phones and how they connect to and share data with computers
- Power and power supplies

HISTORY & TRENDS
- Define the role of the binary and hexadecimal system in the development of information systems
- Report on historical evolution of IT in the US and globally
- Identify significant trends that impact IT locally and globally

ROLE & IMPACT
- Examine economic, social and technological changes to the IT industry
- Identify and discuss use of new technologies and communication systems and their impact on IT

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
2. Schedule appointments

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
> - ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Schedules customer appointments
> - Creates and maintains calendars/schedules
> - Processes requests for appointments
> - Verifies appointments
> - Notifies customers of changes in schedule
> - Manages scheduling conflicts
> - Documents results of customer appointments

Learning Objectives
- Explain your organization's protocols and systems to fulfill service requirements
- Discuss how customer service is facilitated through scheduling appointments
- List items that internal and external customers consider important when scheduling appointments

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
3. Process customer requests

Performance Standard Condition
   Competence will be demonstrated
   - at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
   - ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
   Performance will be successful when the learner:
   - Answers the phone or greet the customer professionally
   - Projects a professional business image (e.g., appearance, voice, grammar, word usage, enunciation, nonverbal communication)
   - Interacts with customers and colleagues in a professional manner (e.g., prompt, friendly, courteous, respectful, helpful, knowledgeable, understandable)
   - Answers customer questions within the realm **of current training & learning** OR refer to worksite professional
   - Handles equipment returns in accordance with customer service policy
   - Compares equipment to order sheets to prepare for delivery to users
   - ***Performs common technical requests***
   - ***Assists to resolve customer requests***
   - Ensures customer needs are met
   - Follows through on commitments made to customers (e.g., special orders, delivery specifications, new items)
   - Documents customer requests and resolution

Learning Objectives
 - Describe your organization's IT services/offerings
 - Identify the internal and external customers within your organization
 - Discuss the process for documenting customer requests and their resolution or referral
 - Explain the importance of documenting customer requests

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
4. Query, view, and extract data

Performance Standard Condition
> **Competence will be demonstrated**
> * at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
> * ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
> **Performance will be successful when the learner:**
> * Accesses needed information using appropriate reference materials
> * Enters data and edit fields and records
> * Sorts and retrieves data from databases
> * Queries to extract information from a file
> * Queries to extract information from multiple files
> * Creates reports from queries as needed
> * Creates and use logical files

Learning Objectives
* Define basic database terms such as database, field, record, query, table
* Identify the appropriate database for a particular situation (e.g., flat, relational)
* Identify the variety of data types that are stored in database management systems (DMS)
* Explain the interrelationships between bytes, fields, records and databases

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
5. Perform common technical requests

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
> - ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Obtains technical request
> - Verifies appropriate authorization for request
> - Ensures appropriate security and access protocols are observed
>   - Sets up and edits user accounts such as for email, internet access, etc.
>   - Enters and updates specific account data
> - Documents request and action taken as required

Learning Objectives
- Outline the computer systems at your facility and how they work together
- List common technical requests that your customers request
- Describe the process and procedures for handling common technical requests at your facility
- Explain the purpose of security and access to files
- Describe the security levels and access for different types of accounts and files

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
6. Assist to resolve customer problems

Performance Standard Condition
Competence will be demonstrated
- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation
- while assisting a worksite professional

Performance Standard Criteria
Performance will be successful when the learner:
- Defines the problem or needs based on request
  - Uses good triage questioning techniques
  - Pre-troubleshoots by working through basic user & equipment errors first
- Troubleshoots the problem
  - Refers to technical manuals, manufacturer information, or troubleshooting posts
  - Confers with users and other worksite professionals
  - Conducts computer diagnostics
  - Uses appropriate hardware/software tools to perform troubleshooting
  - Applies information and data analysis techniques
  - Refers major hardware or software problems or defective products to vendors or technicians for service
- Diagnoses the problem
  - Systematically runs through power, connection, hardware and software checks as required by your facility
- Fixes the problem
  - Repairs/replaces malfunctioning hardware
  - Reinstalls software as needed
  - Performs backup and recovery
  - Restores system to various states (safe modes, previous date, etc.)
- Defines scope of additional work required to meet customer needs
  - Identifies skill, time, and equipment resources needed
  - Formulates a resolution plan with the customer
- Documents technical support and resolution provided ***thoroughly***
- Evaluates the problem-solving resolution to determine whether the problem was solved as intended
- Determines any needed follow-up actions
- Documents problem, diagnosis, resolution, and follow up

Learning Objectives
- Describe a systematic process and steps for basic troubleshooting
- Explain how the following common problems are found and resolved:
  - Startup sequence and beep codes
  - Priorities and interrupts at system level

- o Discuss common error messages and symptoms of hardware failures
- o Hardware versus software failure
- o Need update of flash memory (BIOS)
- o Need for hard drive maintenance procedures (defrag/scan (2) clear caches, etc)
- Practice questioning and troubleshooting skills with common hardware and software problems
- Explain the importance of documentation and follow up of problem resolutions
- Explain the impact of IT/IS problems on organizational costs (e.g., productivity, downtime)
- Classify IT/IS quality costs (e.g., prevention, evaluation, pre-delivery failure, post-delivery failure)

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
7. Perform basic back up procedures

Performance Standard Condition
Competence will be demonstrated
- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
Performance will be successful when the learner:
- Loads or runs backup application(s) as required on a regular basis
- Backs up all data, data changes, etc, as required by organizational policy
- Once back up is complete, ensures appropriate storage of backed up data
- Secures storage "area" of backed up data

Learning Objectives
- Explain the need for regular backup procedures
- Identify the different types of backups (differential, complete, incremental)
- Compare different methods of backing up data and systems
- Describe the recovery process from backed up data
- Identify hot and warm site backup concepts
- Discuss the impact of secure storage of backed up data
- Describe the use of surge suppression protection and battery backup equipment
- Differentiate between disaster recovery and business continuance
- Identify the steps in a disaster recovery plan and a business resumption plan
- Identify methods for avoiding common computer system disasters
- Identify common backup devices
- Explain the purpose of archiving files

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
8. Monitor systems to ensure optimal functioning

Performance Standard Condition
>   **Competence will be demonstrated**
> - at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
> - ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
>   **Performance will be successful when the learner:**
> - Monitors system status and performance regularly as required
> - Runs regular performance diagnostics
> - Enters commands and observe system functioning to verify correct operations and detect errors
> - Refers system messages to worksite professional
> - Performs preventive maintenance procedures on system, computers, & peripheral devices
> - Reviews automated scheduling software
> - ***Assists to resolve problems***
> - Documents monitoring, performance and any errors/malfunctions
> - ***Prepares required reports*** of system operations and functioning

Learning Objectives
 - Describe the purpose of regular system monitoring
 - Compare types of monitoring performed at your facility and their purpose
 - Explain the impact of downtime on business functions and productivity

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
9. Prepare required reports

Performance Standard Condition
    Competence will be demonstrated
- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
    Performance will be successful when the learner:
- Identifies type of report needed
- Accesses needed data and information
- Compiles data into appropriate report
- Checks report for data parameters and information required\
- Analyzes report with worksite professional to ascertain needs, trends or problems

Learning Objectives
- List common reports your department/facility produces for customers
- Explain the purpose of regular report documentation
- Describe record retention of common reports

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
10. Install a desktop system and peripheral equipment

Performance Standard Condition
Competence will be demonstrated
- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
Performance will be successful when the learner:
- Obtains technical request for task
- Verifies appropriate authorization for request
- Obtains or orders applicable equipment hardware, software, cables, operating systems, etc.
- Reviews procedure and safety requirements for appropriate installation and order of connection
- Documents actions taken once completed
DESKTOP
- Connects the power cable to the power outlet. NOTE: Do not plug the power cable into an outlet until the entire computer is set up
- Attaches the monitor cables to the back of the monitor and then to the computer
- Secures the monitor's power cable to the back of the monitor
- Attaches the mouse or wireless mouse receiver to the USB port OR mouse port on the computer
- Plugs the keyboard or wireless keyboard receiver into another USB port OR mouse/keyboard ports on the computer
- Plugs all power cords into a outlet or power strip
- Turns on the computer and the monitor
- Checks the connections and power again if any component fails to power on
- Checks that the mouse and keyboard work once the computer turns on
PERIPHERAL EQUIPMENT
- Obtains peripheral devices required such as a printer, scanner, web cam, etc.
- Verifies connection requirements with peripheral equipment manufacturer information
- Verifies power need (cord or battery) of peripheral equipment
- Connects peripheral equipment into the appropriate ports on the computer(USB, Network, Firewire, etc) as indicated
- Connects peripheral to the power source if required
- Verifies operation of the device once connected
- Checks the connections, and line-of-sight for wireless peripherals, if the peripheral fails to power on
- ***Configures the operating system and drivers*** for the desktop system and peripheral equipment

Learning Objectives
- Identify the function of computer hardware components
- Explain the proper handling of static-sensitive devices
- Describe the safety issues for installing electrical equipment
- Explain the effect of power and power surges on computer hardware and systems
- Discuss how a power strip works
- Identify primary PC components and the functions of each
- Describe the function of CPUs
- Explain how hardware components interact with each other
- Discuss how conflicts arise between hardware component interaction
- Explain how to access needed information using manufacturers' references (e.g., procedural manuals, documentation, standards, work flowcharts)
- Compare advantages and disadvantages between wired and wireless components

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
11. Install & configure an operating system (O/S) and/or drivers

Performance Standard Condition
Competence will be demonstrated
- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
Performance will be successful when the learner:
- Obtains technical request for task
- Selects appropriate tools for installation & configuration
- Confirms enough random-access memory (RAM) is installed on the computer device to run the O/S
- Reviews procedure and safety requirements for appropriate installation
- Inserts and installs the O/S from the file location source
- Follows the instructions on the screen to install the O/S
- Configures the operating system for the required facility identification & control functions, such as security, design look, system information, etc
- Configures peripheral device drivers (e.g., disk, display, printer, modem, keyboard, mouse, network)
- Connects computer device to the Internet
- Connects computer device to peripheral devices, especially printers
- Installs security programs to protect computer device from viruses, malwares, adwares, security breaches, etc
- Selects and **installs applications** software
- Tests integrity and drivers of all devices recognized by O/S
- Refers system errors to worksite professional
- Tests all applications loaded
- Documents system installation activities

Learning Objectives
- Explain how to prepare a hard drive
- Define the purpose of an operating system
- Explain how an O/S works
- Identify differences between O/Ss (Windows/Linux/Mac/DOS)
- Explain the typical components of an O/S (explorer, Control panel, etc)
- Describe the startup sequence of O/Ss
- Describe features of operating systems that can be personalized
- Explain how to manipulate the O/S environment
  - o Desktop, files, and disks
  - o Identify how to change system settings, install, and remove software
  - o Explain how to start and exit a Windows application

- o   Describe how to utilize sources of online help
- Compare operating system utilities (e.g., open source, mobile, proprietary)
- Describe how interfaces work between applications and hardware to be "user-friendly"
- Define API, CLI, and GUI and their use in computers
- Define the purpose of a driver
- List common examples of driver programs
- Define hardware-software interface issues for a computer system
- List common facility identification and control functions configured on computers
- Describe the licensing and copy write requirements and restrictions for operating systems, drivers, interfaces, and applications installed on a computer

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
12. Upgrade an operating system (O/S)

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
> - ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
> **Performance will be successful when the learner:**
- Obtains technical request for task
- Selects appropriate tools for the upgrade
- Confirms enough random-access memory (RAM) is installed on the computer device to run the new O/S
- Reviews procedure and safety requirements for appropriate installation
- Backs up your files and data if required
- Inserts and accesses the upgrade file location source
- Installs the upgraded O/S
- Follows the instructions to install the upgraded O/S
- ONLY if directed by worksite professional- Wipe all previous data and re-format the hard drive IF required for a completely new system or for a problem resolution
- Re-boots the system if needed
- Configures the operating system for the required facility identification & control functions, such as security, design look, system information, etc
- Connects computer device to the Internet
- Allows the computer device to seek and install any updates according to facility policy
- Connects computer device to peripheral devices, especially printers if needed
- Installs security programs to protect computer from viruses, malwares, adwares, security breaches, etc, if required
- Selects and **installs applications** software if needed from wiping computer clean
- Tests integrity and drivers of all devices recognized by O/S
- Refers any system errors to worksite professional
- Tests all applications loaded
- Documents O/S upgrade activities

Learning Objectives
- Describe circumstances when it is necessary to reformat a hard drive
- Compare the processes for a simple manufacturer O/S upgrade to a complete re-formatting of the computer
- Define partitioning of a hard drive and when it is indicated

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
13. Install and uninstall an application

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
> - ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Obtains technical request for task
> - Documents actions taken once completed
> INSTALL
> - Ensures the computer device configuration meets the requirements needed for the application
> - Reviews procedure and safety requirements for appropriate installation
> - Closes down all other programs running
> - Inserts and installs the application from the file location source
> - Follows onscreen prompts during the installation
> - If there are no prompts, installs the program from the "set up" or "install" file under the drive where the program is inserted
> - Installs any other programs, files, utilities required to run the application
> - Reboots the computer if required
> UNINSTALL
> - Uninstalls the application under Control Panel- Add/Remove Programs
> - If not listed, verifies if application has already been removed
> - If application still loaded, manually uninstalls **ONLY If** directed by worksite professional
> MANUAL UNINSTALL (**WITH WORKSITE PROFESSIONAL**)
> - Backs up system first
> - Renames to break the shortcuts OR deletes the application's program group directory
> - Checks with worksite professional regarding registry information
> - Deletes any shortcut folders to application
> - Disables application startup/login if it ran at startup

Learning Objectives
- Identify how software and hardware work together to perform computing tasks
- Explain how software is developed and upgraded
- Identify different types of software
- Give some reasons why applications are uninstalled
- Describe reasons for renaming an application rather than deleting it
- Explain the process for removing applications in your facility
- Explain how installed software versions on company computers are managed and controlled

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
14. Install operating system (O/S) service packs and security patches

Performance Standard Condition
Competence will be demonstrated
- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
Performance will be successful when the learner
- Obtains technical request for task
- Selects appropriate tools for the upgrade
- Confirms computer device meets prerequisites of the service pack or security patch
- Reviews procedure and safety requirements for appropriate installation
- Backs up your files and data if required
- Inserts and accesses the pack or patch file source
- Installs the O/S service pack or security patch
- Follows any prompts to complete the installation
- Refers error messages to worksite professional and check installation directions/information
- Documents installation

Learning Objectives
- Explain the purpose and function of service packs and security patches

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
15. Ghost a computer

Performance Standard Condition
Competence will be demonstrated
- at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
- ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
Performance will be successful when the learner
- Sets up 2 hard drives- one to ghost and new one onto which the cloned files will be placed
- Checks to ensure that the destination hard drive can accommodate all the software to be ghosted
- Checks that the two hard drives are compatible
- Selects the proper software to use for ghosting
- Installs ghosting software onto the hard drive to ghost
- Checks software to ensure that it is running properly before ghosting
- Boots up the ghosting software and select the drive with the partition or files to be ghosted
- Selects a destination hard drive
- Chooses the size of the partition or files, compression choice, and name
- Confirms that files selected to ghost, and click "Proceed" and "OK" or yes
- Waits for the software to ghost the files
- Documents ghosting process

Learning Objectives
- Define "ghosting" a computer
- Compare ghosting to copying
- Explain when ghosting is indicated
- Describe how partitioning is related to ghosting a computer

Comments:

Unit 3: ALL Pathways
IT Essentials

Competency
16. Participate on a system project team

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite or in the classroom in a simulated setting. Simulation should ONLY be used IF there is no possibility of skill performance at the worksite.
> - ONLY up to FOUR skill competencies in this unit can be performed and assessed in simulation

Performance Standard Criteria
Performance will be successful when the learner
- Reviews the scope and phases of the system project
- Reviews the evaluation of the problem and the decision evidence for the system project
- Participates in the following system project team activities as able
- Identifies the cross-functional/departmental team required for the project
  - Take part in technical training or orientation for the system project
  - Develop task list
  - Evaluate project requirements
  - Identify required resources and budget
  - Estimate time requirements
  - Develop initial project management flowchart
  - Identify interdependencies
  - Identify critical milestones
  - Evaluate risks
  - Prepare contingency plan
  - Track critical milestones
  - Participate in project phase review
  - Report project status
  - Evaluate implementation
- Periodically reviews system project activities completed during the course of the project and their results

Learning Objectives
- Determine how business activities interface with data processing functions
- Explain how increases in productivity are realized by the implementation of information systems
- Summarize the importance of cross-functional teams in achieving IT project goals
- Describe strategies for maximizing productivity in a high tech environment
- Classify costs (e.g., direct and indirect, fixed and variable, methods and standards)
- Define the purpose of common quality tools used during IT projects

Comments:

Appendix L

**INFORMATION TECHNOLOGY (IT)
YOUTH APPRENTICESHIP**

**NETWORK SYSTEMS AND
INFORMATION SUPPORT & SERVICES PATHWAY
HARDWARE UNIT
UNIT 4**

Unit 4: Network and Support & Services Pathway
Hardware

Competency
1. Maintain network records

Performance Standard Condition
Competence will be demonstrated
- at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
- Uses tracking systems to log requests, monitor progress, and track problem resolution
- Maintains logs related to network functions
- Manages maintenance and repair records as required
- Adds and deletes files on the network server ONLY as directed by the worksite professional
- Backs up network files regularly following facility procedure

Learning Objectives
- Identify network fundamentals
- Identify the benefits and risks of network computing
- Identify the relationship between computer networks and other communications networks (e.g., Telephone Network), and the Internet
- Describe the purpose of typical network records for uptime, access, network traffic, bandwidth, disk utilization

Comments:

Unit 4: Network and Support & Services Pathway Hardware

Competency
2. Communicate with vendors

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Tracks and maintains vendor orders and receipt of order
> - Contacts vendors to coordinate shipping items if needed
> - Verifies receipt of order
> - Compares items received to order
> - Reconciles any discrepancies with worksite professional and vendor
> - Records addition of items to inventory
> - Returns a faulty product to the vendor
> - Contacts vendors for warranty repairs
> - Works with vendors to resolve hardware operating system issues

Learning Objectives
- Describe the role of the accounting function in processing purchase orders and packing slips
- Explain how documentation is necessary for maintaining proper inventory
- Explain the inventory processes at your facility
- Discuss the life cycles and costs of different types of hardware
- Explain the purpose of warranties and purchasing options for hardware purchases

Comments:

Unit 4: Network and Support & Services Pathway
Hardware

Competency
3. Perform basic technical network support duties

Performance Standard Condition
Competence will be demonstrated
- at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
- ***Assists to resolve customer problems***
- Provides technical support via telephone, E-mail, Web and onsite as needed
- Responds to user questions within realm of ***current training and learning***
- Chooses correct technical and computer tools to perform task
- Documents technical support provided
- Performs routine tasks as directed by worksite professional
    - o Load computer tapes and disks onto network
    - o Install software and printer paper/forms
    - o Perform routine network startup and shutdown procedures
    - o Help users with common operating systems, applications, and network-related procedures

Learning Objectives
- Identify computer classifications and hardware
- Identify major hardware components and their functions
- Identify the hardware associated with telecommunications functions
- Identify types of computer storage devices
- Identify how the four components of a network operating system support network operations (server platform, network services software, network redirection software, communications software)
- Compare and contrast local area networks (LANs), metro area networks (MANs), wide area networks (WANs), the Internet, intranets, and other data communications systems
- Trace the evolution of networks
- Analyze current trends and development in LANs
- Describe basic network classifications, topologies and network operating systems (NOS)
- Interpret basic networking terminology
- Identify the basic point-to-point network topologies (e.g., star, ring, tree, network, irregular)
- Differentiate between point-to-point and point-to-multipoint network topologies
- Identify the basic broadcast topologies (e.g., star, ring, bus)

Comments:

Unit 4: Network and Support & Services Pathway
Hardware

Competency
4. Assist to monitor network performance

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite
> - while assisting a worksite professional

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Monitors system status and performance regularly as required
> - Follows power-up and log-on procedures
> - Monitors network center dust, temperature, and humidity controls
> - Monitors system status and performance via reports and diagnostic monitoring systems
> - Operates master consoles to monitor the performance of computer systems and networks
> - Identifies required service level
> - Identifies abnormal system performance
> - Recognizes system alerts
> - Recognizes security problems
> - Recognizes environmental problems
> - Identifies patterns of failure
> - Refers any noted issues to worksite professional
> - Follows log-off and power-down procedures
> - Documents monitoring activities and results

Learning Objectives
- List general characteristics of network operating systems
- Compare network operating systems (i.e., Windows XP, LINUX, UNIX, etc.)
- Discuss the difference between stand-alone, peer-to-peer and client-server networks and software
- Explain how information traffic priorities are determined and monitored
- Identify components and characteristics of public networks (e.g., telephone, cable, satellite, wireless)
- Describe server functions including specialized servers (e.g., Web, DHCP, DNS, mail, proxy)
- Identify hardware and software requirements for specialized servers

Comments:

Unit 4: Network and Support & Services Pathway
Hardware

Competency
5. Perform routine network system maintenance

Performance Standard Condition
Competence will be demonstrated
- at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
- Follows preventive maintenance plan
- Runs diagnostics as required
- Refer system messages to worksite professional
- Performs preventive maintenance procedures on network, computers and peripheral devices
- Identifies new or replacement networking components needed
- Evaluates maintenance processes and outcomes with worksite professional
- Documents maintenance activities and results

Learning Objectives
- Describe the basic elements of network maintenance
- Identify available diagnostic tools used for network system maintenance
- Identify maintenance procedures and processes
- Explain the purpose and function of a routing protocol
- List characteristics and uses of network components (e.g., hub, switches, routers, firewall)
- Differentiate between a physical and logical topology
- Explain LAN transmission methods, standards and protocols
- Explain the difference between types of inputs such as DVI & VGA video and eSATA & USB & Firewire inputs
- Identify types of processing (e.g., batch, interactive, event-driven, object-oriented)
- Explain network architecture frame types and formats
- Explain the principles and operation of wire (coaxial, fiber optics, etc.) and wireless systems
- Explain the principles and operation of fiber optics, analog and digital circuits

Comments:

Unit 4: Network and Support & Services Pathway
Hardware

Competency
6. Assist to apply network upgrades, service packs, and patches

Performance Standard Condition
Competence will be demonstrated
- at the worksite
- while assisting a worksite professional

Performance Standard Criteria
Performance will be successful when the learner:
- Obtains technical request for task
- Selects appropriate tools for the upgrade
- Reviews procedure and safety requirements for appropriate installation
- Backs up your files and data if required
- Inserts and accesses the pack or patch file source
- Installs and configures Internet software packages
- Upgrades network system software
- Follows any prompts to complete the installation
- Refers any error messages to worksite professional and refer to the installation directions/information
- Documents installation

Learning Objectives
- Explain the need for upgrades, packs & patches
- Discuss the benefits and drawbacks of custom configuration of network applications

Comments:

Unit 4: Network and Support & Services Pathway Hardware

Competency
7. Upgrade portable devices

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Obtains technical request for task
> - Selects appropriate tools for the upgrade
> - Obtains portable device
> - Verifies upgrade requirements with upgrade technical information
> - Reviews procedure and safety requirements for appropriate installation
> - Backs up files and data if required
> - Inserts and accesses the upgrade file location source
> - Follows the instructions to install the upgraded software
> - Re-boots the device if needed
> - Re-configures the device if needed
> - Verifies operation of the device once upgraded
> - Refers any errors to worksite professional
> - Documents upgrade activities

Learning Objectives
- Give examples of emerging hardware technologies
- Identify hardware devices appropriate for specific tasks
- Compare processes of upgrading devices to upgrading desktop systems

Comments:

Unit 4: Network and Support & Services Pathway
Hardware

Competency
8. Replace inoperable computer components

Performance Standard Condition
   Competence will be demonstrated
   • at the worksite

Performance Standard Criteria
   Performance will be successful when the learner:
   • Obtains technical request for task
   • Selects appropriate tools for the task
   • Reviews procedure and safety requirements for appropriate replacement
   • Backs up files and data
   • Removes power source and cables
   • Opens up computer device
   • Cleans the internal components using appropriate procedures, if needed
   • Labels all connections that attach to the damaged part
   • Removes cables & connections from part to be replaced
   • Removes old part
   • Replaces with new hard drives, motherboards, and/or network cards as needed
   • Ensures new part is securely fastened
   • Reattaches all connections and cables as required for new part
   • Closes up computer device
   • Powers on the machine
   • Reconfigures the settings
   • Reboots and tests the new part as required
   • Documents parts replacement
   • Maintains the inventory of spare parts for emergency repairs

Learning Objectives
   • Identify different pieces of hardware based on input/ouput; e.g., Identify if a card is PCI or if a hard drive is IDE/SATA
   • Identify hardware components from the back end of the component or its connection
   • Explain the required care for hardware components
   • Discuss the danger from static when working with computer components
   • Describe the preventive measures and protective equipment needed to work on internal computer components
   • Explain the cleaning process for internal computer devices
   • Describe visual inspection points for internal computer devices

Comments:

Unit 4: Network and Support & Services Pathway
Hardware

Competency
9. Assist to troubleshoot network system and data communication problems

Performance Standard Condition
Competence will be demonstrated
- at the worksite
- while assisting a worksite professional

Performance Standard Criteria
Performance will be successful when the learner:
- Detects problem
- Identifies available diagnostic tools used for system maintenance
- Performs appropriate analysis to identify problem cause
- Isolates system faults in hardware and various types of networks, cables, data modems, and networking carrier systems
- Identifies areas of operation that need upgraded equipment such as modems, fiber optic cables, and telephone wires
- Identifies criticality of problem
- Develops resolution plan
- Identifies possible solutions
- Tests identified solutions
- Documents troubleshooting results and solutions

Learning Objectives
- Define bandwidth
- Explain the concept of bandwidth as it pertains to network data communication problems
- Define packet-switching techniques
- Compare characteristics of connection-oriented and connectionless networks
- Identify emerging networks and technologies
- Describe basic telephony (analog vs. digital signals)
- Explain how analog speech is converted to digital
- Demonstrate knowledge of Voice over IP (VoIP) concepts
- Explain convergence issues, including codec choice, jitter, wander, and connecting analog telephone adapter equipment
- Explain the benefits of implementing convergence
- Identify standard high-speed networks (e.g., broadband, ISDN, SMDS, ATM, FDDI)
- Explain the purpose and function of the TCP/IP protocol suite
- Discuss interconnecting LANs using WAN services
- Explain the impact of wireless technologies on data communication
- Describe common wireless problems

Comments:

Unit 4: Network and Support & Services Pathway
Hardware

Competency
10. Assist to install or upgrade network equipment

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite
> - while assisting a worksite professional

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Obtains technical request for task
> - Selects appropriate tools for installation, configuration & upgrade
> - Confirms prerequisites for the new equipment or upgrade
> - Reviews procedure and safety requirements for appropriate installation
> - Inserts and installs the equipment at the correct locations in the correct manner
> - Inserts and installs software from the file location source
> - Installs and configures network cabling, modems, routers, mail servers, etc.
> - Installs and configures network management software
> - Accesses needed technical information using software help facilities if needed
> - Loads software with minimum disruption of process flow
> - Tests integrity of all devices and software added or upgraded
> - Resolves any system errors or compatibility issues
> - Documents network system installation or upgrade activities

Learning Objectives
- Describe the design of the network system at your facility
- List the purpose and function of the necessary components that make up the network design
- Identify principles governing software acquisition and upgrades
- Discuss how data is commonly converted between different software packages and between software and the O/S
- Distinguish between routing and routed protocols
- Explain how to install and configure routers to simulate a LAN/WAN environment
- Describe server virtualization and its impact
- Discuss distributed storage technologies (e.g., SAN, NAS)

Comments:

Unit 4: Network and Support & Services Pathway
Hardware

Competency
11. Participate on a networking systems evaluation project team

Performance Standard Condition
Competence will be demonstrated
- at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
- Reviews the scope and phases of the network systems evaluation project
- Reviews the needs analysis and decision evidence for the project
- Participates in the following network systems evaluation team activities as able:
    o Retrieve data for analysis of system capabilities and requirements
    o Analyze equipment performance records to determine the need for repair or replacement
    o Gather data pertaining to customer needs
    o Identify, predict, interpret, and evaluate system and network requirements
    o Confer with network team and users to solve existing system problems
    o Identify costs and benefits for networking solutions
    o Recommend changes to improve systems and network configurations
    o Determine hardware or software requirements related to such changes
    o Order, install or upgrade, and test changes
    o Monitor changes to ensure they brought about expected results
- Periodically reviews system project activities and completed results

Learning Objectives
- Identify site and network system constraints that impact your facility
- Identify power and power supplies
- Define power conversion
- Analyze a facilities' network capacity planning (power cable/wire conduit)
- Identify security requirements and the need for data protection
- Identify specific access levels that need to be accommodated
- Explain how a security system design is matched to identified security requirements
- Demonstrate knowledge of the role that routers, firewalls, intrusion detection systems, and VPNs play in security

Comments:

Appendix M

**INFORMATION TECHNOLOGY (IT)
YOUTH APPRENTICESHIP**

**PROGRAMMING & SOFTWARE DEVELOPMENT AND
INFORMATION SUPPORT & SERVICES PATHWAY
SOFTWARE UNIT
UNIT 5**

Unit 5: Programming & Software Development and Support & Services Pathway
Software

Competency
1. Use basic office software applications

Performance Standard Condition
Competence will be demonstrated
• at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
• Accesses software application
• Utilizes basic features of Spreadsheet, Word Processing, Internet and Email applications as required for job tasks
• Changes application settings
• Manages files within an application
• Performs common editing and formatting functions
• Performs common printing functions
• Queries, adds, deletes, edits, saves, and prints information as applicable using these software applications
SPREADSHEETS
• Modifies worksheet data and structure
• Formats data in a worksheet
• Sorts data, manipulates data using formulas and functions
• Adds and modifies charts in a worksheet
WORD PROCESSING
• Formats text and documents Including the use of automatic formatting tools
• Inserts, edits, and formats tables in a document
INTERNET
• Uses search engines and URLs to locate valid information
EMAIL
• Creates, edits, saves, sends, and prints email communications
PUBLISHING/PRESENTATION APPLICATIONS
• Creates, edits, saves, and prints a document or presentation using these kinds of applications

Learning Objectives
• Identify new data technologies relevant to information technology
• Identify data communication trends and major current issues
• Explain how computing/networking hardware and software architecture interact
• List types of widely used software applications (e.g., word processing, database management, spreadsheet development)
• Identify new and emerging classes of software
• Identify common on-screen elements of Windows software applications
• Identify how electronic mail works

- Identify different types of information sources on the Internet
- Describe how to evaluate internet web sites and information for validity and reliability
- Explain appropriate and inappropriate uses of email and internet while at work
- Describe how to develop effective presentations using appropriate technologies (e.g., tables, charts, and visual graphics)
- Explain the use of writing/publishing/presentation applications
- Describe how database and spreadsheet technology is used at your worksite to manage worksite operations

Comments:

Unit 5: Programming & Software Development and Support & Services Pathway
Software

Competency
2. Assist to maintain database security measures

Performance Standard Condition
Competence will be demonstrated
- at the worksite
- while assisting a worksite professional

Performance Standard Criteria
Performance will be successful when the learner:
- Follows all security protocols for access, addition and deletion of access to databases
- Maintains confidentiality
- Loads virus detection and protection software
- Identifies sources of virus infections
- Removes viruses
- Reports viruses in compliance with company standards
- Provides for user authentication and restricted access (e.g., assign passwords, access level)
  - o Obtain technical request as required to security requests
  - o Verify security authorization
  - o Set up new user accounts
  - o Delete old user accounts
  - o Modify current user accounts
- Documents request and action taken as required

Learning Objectives
- Identify and evaluate industry trends in database systems
- Discuss security needs for a database
- Explain the purpose of security and access to files
- Describe the security levels and access for different types of accounts and files
- Specify users and user access levels for each segment of a database
- Analyze legal and ethical dilemmas (e.g., virus development, hacking, phishing)
- Describe the role of computer forensic investigators
- List common internet crimes
- List some prevention actions related to cyber crime
- Describe techniques to identify criminal activity

Comments:

Unit 5: Programming & Software Development and Support & Services Pathway
Software

Competency
3. Monitor and maintain date integrity

Performance Standard Condition
Competence will be demonstrated
- at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
- Identifies maintenance requirements
- Performs monitoring and maintenance activities regularly as required
- Verifies that all possible security safeguards are in place
- Selects and enters codes to monitor database performance
- Performs database queries to analyze database functionality
- Measures changes in productivity using metrics
- ***Assists to troubleshoot application and database problems***
- Communicates and documents maintenance activities and results

Learning Objectives
- Identify the elements of the information processing cycle (i.e., input, process, output, and storage)
- Describe the information system life cycle
- Identify current information life cycle models
- Explain the key functions of database system software
- Explain measurement techniques for performance
- Explain primary reasons for the need for data conversion
- Explain the basic concepts and potential for loss of data in data conversions

Comments:

Unit 5: Programming & Software Development and Support & Services Pathway
Software

Competency
4. Assist to troubleshoot application and database problems

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite
> - while assisting a worksite professional

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Detects problem
> - Identifies available diagnostic tools used for application and database system maintenance
> - Performs appropriate analysis to identify problem cause
>   - Identify function affected
>   - Identify what changed
>   - Identify how it's supposed to work
>   - Identify what doesn't match up
> - Rules out hardware equipment issues
> - Isolates system faults in database and applications
> - Identifies criticality of problem
> - Develops resolution plan
> - Identifies possible solutions
> - Modifies existing databases and database management systems or reports to programmers and analysts to make changes
> - ***Assists to test software programming changes or modification***
> - Documents troubleshooting results and solutions

Learning Objectives
- List common issues or concerns with database applications
- Describe search strategies
- Explain how search queries are used to extract useful information
- Describe how application and database issues are documented and hard-coded for future reference

Comments:

Unit 5: Programming & Software Development and Support & Services Pathway
Software

Competency
5. Create a database

Performance Standard Condition
Competence will be demonstrated
- at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
- Creates a database from model specifications using both program code and Graphic User Interface (GUI) processes when provided by the database software
- Verifies that all possible security safeguards are in place
- Plans and develops record specifications
- Modifies record structures
- Populates the database created with test data
- Performs database queries to analyze database functionality and diagnose problems
- Performs database troubleshooting and system-tuning functions

Learning Objectives
- Explain database development processes
- Define database model
- Compare types of database models
- Describe a brief history of database management systems
- Review a data model describing data elements and how they are used
- Compare advantages and disadvantages of data centralization and data decentralization and its impact on computing processes
- Describe application development tools used with a database system to create solutions for an organization
- Define database schema
- Explain the purpose and function of database normalization
- Discuss industry standards for platform interface development (e.g., XML, ASP, PHP)
- Explain the process of data mining

Comments:

Unit 5: Programming & Software Development and Support & Services Pathway
Software

Competency
6. Acquire and install new software

Performance Standard Condition
 Competence will be demonstrated
  • at the worksite

Performance Standard Criteria
 Performance will be successful when the learner:
  • Verifies the ***application package has been evaluated***
  • Researches the compatibility of the hardware and software
  • Identifies hardware requirements (e.g., processor, memory, disk space, communications, printers, monitors) required
  • Verifies that software to be installed is licensed prior to performing installation
  • Installs given application/system software in accordance with manufacturer's procedures
  • Selects appropriate installation options (e.g., default, customized)
  • Configures software to appropriate operating system and user application settings
  • ***Converts data files*** if required
  • ***Assists to test new software***
  • Refers unexpected results to worksite professional
  • Documents installation, settings and testing of new software

Learning Objectives
 • Identify common system processing requirements
 • Explain the concept of an End User License Agreement (EULA)
 • Differentiate between open source, single-user, multiple and proprietary licenses
 • Explain the concept of open source
 • Identify common characteristics of open source licensing agreements, including the GNU General Public License (GPL)
 • Differentiate between procedures for an upgrade and for a new installation
 • Differentiate between stand-alone and network software installation procedures

Comments:

Unit 5: Programming & Software Development and Support & Services Pathway
Software

Competency
7. Assist to test software programming changes or modifications

Performance Standard Condition
Competence will be demonstrated
- at the worksite
- while assisting a worksite professional

Performance Standard Criteria
Performance will be successful when the learner:
- Follows defined test procedures
- Accesses and runs test cases using requirements and design specification
- Helps with unit testing, integration, and regression testing as required
- Helps with user-acceptance testing
- Documents testing results and any errors discovered

Learning Objectives
- Define the purpose and principle of unit testing
- Define the purpose and principles of integration testing
- Define the purpose and principles of regression testing
- Define the purpose and principles of user-acceptance testing
- Explain how to resolve program implementation issues (e.g., debugging, documentation, auditing)
- List common software development issues (e.g., audit ability, correctness, reliability, and productivity)
- Explain how programming control structures are used to verify correctness

Comments:

Unit 5: Programming & Software Development and Support & Services Pathway
Software

Competency
8. Evaluate application software packages

Performance Standard Condition
Competence will be demonstrated
- at the worksite or in the classroom in a simulated setting

Performance Standard Criteria
Performance will be successful when the learner:
- Performs work flow analysis to determine user needs
- Evaluates appropriateness of software for specific projects
- Prepares a cost-benefit analysis for a software package
- Documents results of the software evaluation
- Performs a software configuration audit
- Performs a physical configuration audit

Learning Objectives
- Identify common system processing requirements
- Describe how to conduct work flow analysis
- Describe how to conduct a cost-benefit analysis
- List elements to evaluate in a software configuration audit
- List elements to evaluate in a physical configuration audit

Comments:

Unit 5: Programming & Software Development and Support & Services Pathway
Software

Competency
9. Write code

Performance Standard Condition
Competence will be demonstrated
- at the worksite or in the classroom in a simulated setting

Performance Standard Criteria
Performance will be successful when the learner:
- Analyzes and prepares logic using a program flowchart
- Analyzes and prepares logic using at least one alternative to flowcharting such as pseudo-coding
- Reviews design (e.g., peer and/or user walkthrough)
- Uses appropriate programming language
- Compiles and debugs code
- Prepares code documentation
- Prepares unit testing plan
- Conducts unit testing and bug fixes

Learning Objectives
- Identify and define object-oriented programming terminology
- List current key programming languages and the environment they are used in
- Compare languages used in software development
- Identify the use of program design tools in a software development process
- Explain programming language concepts
- Describe the necessary the hardware-software connections for programming
- Explain the concepts of data and procedural representations
- Discuss the basic principles for analyzing a programming language
- Explain programming structures
- Compare source and object code
- List the basics of structured, object-oriented language
- Explain how a programming language can support multitasking and exception-handling
- Describe how data structure and program design is translated into code in an appropriate language
- Describe the function and operation of compilers and interpreters
- Summarize how data is organized in software development
- List common key constructs and commands specific to a language you will be using
- Define structured/modular programming

Comments:

Unit 5: Programming & Software Development and Support & Services Pathway
Software

Competency
10. Participate on a software development or customization project team

Performance Standard Condition
Competence will be demonstrated
- at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
- Reviews the scope and phases of the software development project
- Reviews the needs analysis and decision evidence for the software development project
- Participates in the following software development team activities as able:
  - Perform workflow analysis to determine user needs
  - Analyze existing procedures
  - Define business problem to be solved by the application
  - Develop networking, hardware, and software requirements and specifications
  - Access needed information using company and manufacturers' references (e.g., procedural manuals, documentation, standards, word flowcharts)
  - Divide design specifications into logical process blocks
  - Identify constraints
  - Identify key functions and subsystems of the software product
  - Identify software development process and issues
  - Design project plan
  - ***Write code*** using appropriate programming language
  - Use code development tools (e.g. debugger, integrated development environments)
  - ***Assist to test software programming***
- Periodically reviews system project activities and completed results

Learning Objectives
- Identify roles of team members/customers in the software development process
- Describe software development processes and methodology
- Discuss key elements of functional requirements for software development
- Discuss nonfunctional requirements for a software development plan (e.g., security, integrity response time, reliability, support, and documentation)
- Explain the use, structure, and contents of a requirements specification document
- Explain how to use modeling and analyze functional requirements (e.g., dataflow diagrams, process specifications, and a data dictionary)
- Explain how to use modeling and analyze data requirements (e.g., Jackson diagrams, entity relationship diagrams, and relations)
- Describe common system analysis issues related to design, testing, implementation, and maintenance
- Identify standards and issues related to I/O programming and design of I/O interfaces

- Recognize the relationship between dependability, functionality, ease of use, etc.
- Describe trade-offs involved in design choices

Comments:

Appendix N

**INFORMATION TECHNOLOGY (IT)
YOUTH APPRENTICESHIP**

**WEB & DIGITAL COMMUNICATIONS PATHWAY
WEB & DIGITAL MEDIA UNIT
UNIT 6**

Unit 6: Web & Digital Media Pathway
Web & Digital Media

Competency
1. Maintain web/digital media production and progress records

Performance Standard Condition
Competence will be demonstrated
• at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
• Selects appropriate forms/records
• Codes documents as required
• Files forms/records in appropriate location
• Retrieves and replaces files in correct position
• Uses appropriate computer codes, formatting, macros, charts, spreadsheets, etc.
• Verifies data prior to entry/storage
• Maintains files
• Works with team members to report project status
    o Compile information in format required
    o Identify and track critical milestones
    o Regularly, report project status to team members in a timely and accurate manner as required

Learning Objectives
• Identify the history and fundamentals of the internet and digital communications
• Explain the use on internet based communications tools such as social networking, online collaboration, online learning, and online meetings and conferences
• Describe the impact of online technologies and communications to personal, educational and business entities
• Compare features of different online social, collaboration and business tools
• Explain the process for documenting web and digital communication work
• Describe the importance of record retention in development projects

Comments:

Unit 6: Web & Digital Media Pathway
Web & Digital Media

Competency
2. Assist to outline structural content

Performance Standard Condition
Competence will be demonstrated
- at the worksite
- while assisting a worksite professional

Performance Standard Criteria
Performance will be successful when the learner:
- Refers to client requirements and project plan
- Lists the areas of information to be disseminated
- Organizes the basic information into an outline of content to be used within each area (site map)
- Selects the media elements (e.g., sound, video, graphics, text, motion graphics) to be used with the verbal content
- Prepares draft flowcharts, navigational blueprints and/or storyboards to describe the verbal content and media elements for each page
- Finalizes the draft outline with details on layout and interface of pages

Learning Objectives
- Explain the concept of intellectual property
- Differentiate between copyright and trademarks
- Describe the function of a non-disclosure agreement (NDA)
- Explain the impact publication process and distribution method have on product development
- Explain how copy write and trademark law applies legally and ethically to the use of other source code and web page design
- Define the purpose and function of WAI (Web Accessibility Initiative) guidelines

Comments:

Unit 6: Web & Digital Media Pathway
Web & Digital Media

Competency
3. Assist to create verbal content

Performance Standard Condition
Competence will be demonstrated
- at the worksite
- while assisting a worksite professional

Performance Standard Criteria
Performance will be successful when the learner:
- Refers to client requirements and project plan
- Collects the text documents (content information) and images that will appear on the web site or in the digital communication product from the client
- Reads through the content information
- Confers with worksite professional to determine key content pieces to include or highlight in final product
- Writes script OR arranges content from client content information
- Reviews, edits, and revises content with client & worksite professional
- Finalizes content
- Converts content into a format which can be viewed
- Works with other team members to integrate the verbal content with site design for final product

Learning Objectives
- Define the purpose and use of web metrics and governance (policies and stylebooks)
- Discuss some cultural implications on design and deployment of digital communication products
- Explain ways to manage and update verbal content on a web sites and in other digital communication methods

Comments:

Unit 6: Web & Digital Media Pathway
Web & Digital Media

Competency
4. Create or edit images and graphics for website/digital media use

Performance Standard Condition
Competence will be demonstrated
- at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
- Refers to client requirements and project plan
- Creates or edits images and graphics based on knowledge of principles of design (color theory and schemes, proximity, alignment, repetition, web graphics, optimization, typography)
  - o Produce or acquire graphics content
  - o Produce or acquire audio content
  - o Produce or acquire video content
- Determines size and arrangement of graphics material and copy
- Selects style and size of type
- Draws and prints charts, graphs, illustrations, and other artwork, using computer
- Uses computer software to generate new images
- Evaluates visual appeal with worksite professional
- Reviews, edits, and revises images & graphics with client & worksite professional
- Makes improvements as needed
  - o Alter digitized images using an image manipulation program
  - o Alter digitized video using a video manipulation program
- Finalizes images and graphics
- Converts images and graphics into a format which can be viewed

Learning Objectives
- Describe principles and elements of design
- Explain how color theory is used to select appropriate colors
- Define typography
- Discuss how elements of typography are incorporated into overall design
- Explain how basic motion graphics are programmed
- Give examples of photographic special effects and how they are incorporated into interactive media presentations
- Describe how to integrate photographically derived images with hand-drawn graphic images
- Explain the use of digital imaging, digital video techniques, and equipment to obtain images
- List common graphics, video, motion graphics, and web software programs
- Describe the use of integrated development environments (such as Visual Studio, Dreamweaver, Flash, Waterproof, etc)
- Describe the basic principles of motion graphics
- Identify how different user agents (browsers, devices) affect the digital communication product

Comments:

Unit 6: Web & Digital Media Pathway
Web & Digital Media

Competency
5. Create templates for website layout

Performance Standard Condition
> **Competence will be demonstrated**
> • at the worksite

Performance Standard Criteria
> **Performance will be successful when the learner:**
> • Refers to client requirements and project plan
> • Creates the website layout template based on knowledge of principles of design (color theory and schemes, proximity, alignment, repetition, web graphics, optimization, typography)
>   o Create an integrated template theme for the Portal Page, Sub Pages, etc.
> • Determines size and arrangement of graphics material and copy
> • Selects style and size of type
> • Draws and prints charts, graphs, illustrations, and other artwork, using computer
> • Uses computer software to generate new images
> • Evaluates visual appeal with worksite professional
> • Reviews, edits, and revises template with client & worksite professional
> • Makes improvements as needed
> • Finalizes template
> • Converts template into a format which can be viewed

Learning Objectives
- Define reusable components and how that relates to web design
- Describe principles and elements of design
- Explain how color theory is used to select appropriate colors
- Define typography
- Discuss how elements of typography are incorporated into overall design
- List sources of web design element help
- Describe the use of integrated development environments (such as Visual Studio, Dreamweaver, Flash, Waterproof, etc)
- Identify how different user agents (browsers, devices) affect the digital communication product

Comments:

Unit 6: Web & Digital Media Pathway
Web & Digital Media

Competency
6. Write program code for a website

Performance Standard Condition
Competence will be demonstrated
- at the worksite or in the classroom in a simulated setting

Performance Standard Criteria
Performance will be successful when the learner:
- Refers to client requirements, project plan, and site map plan
- Codes the website elements (content, links, images, graphics, specialized scripts) created using HTML or GUI design software
- Creates pages that can be used on any type of server and viewed with any type of browser
- Reviews, edits, and revises coding as needed
- Reviews draft product with client & worksite professional
- ***Performs user testing***

Learning Objectives
- Explain the features and functions of Web page design software
- Compare/contrast the features and functions of software editors available for designing web pages
- Identify standard scripting languages (e.g., JavaScript, .NET frameworks, PHP, ActiveX)
- Explain the uses and advantages/disadvantages of various scripting languages
- Explain how to use a scripting language to program a site
- Compare the web coding languages & formatting of HTML, XHTML, CSS, XML/XSL
- Describe how version control and documentation are used and managed in programming web pages
- Explain the coding elements required for basic web application security.
- Discuss the code elements needed to ensure that a website is compatible across multiple browsers and devices
- Explain importance of web standards
- Explain the purpose of web content delivery enablers (e.g., CGI, API, SSI)
- Describe how to interface client/server
- Explain advantages & disadvantages of client-side processing
- Identify security issues related to server-side processing

Comments:

Unit 6: Web & Digital Media Pathway
Web & Digital Media

Competency
7. Assist to create specialized scripts/motion graphics

Performance Standard Condition
Competence will be demonstrated
- at the worksite
- while assisting a worksite professional

Performance Standard Criteria
Performance will be successful when the learner:
- Refers to client requirements, project plan, and site map
- Coordinates with programmers to create specialized scripts
    - o Use motion graphics to create a visual Web/digital designs
    - o Produce or acquire the specialized script or motion graphics content
- Creates the special feature based on knowledge of principles of design (color theory and schemes, proximity, alignment, repetition, web graphics, optimization, typography)
    - o Employ basic motion graphic programming knowledge demonstrating use of key frames and frames, impact of deployment device, animation techniques, security and compatibility across multiple browsers or devices
- Reviews, edits, and revises scripts/motion graphics with client & worksite professional
- Makes improvements as needed
    - o Alter digitized images using an image manipulation program
    - o Alter digitized video using a video manipulation program
- Finalizes script/motion graphics
- Converts script/motion graphics into a format which can be viewed

Learning Objectives
- Describe the purpose for enhanced web and digital experiences
- Compare motion graphics to other forms of media
- List common types of specialized scripts that a client may require
- Define and compare podcasts, vodcasts, and other e-business, e-commerce and e-training solutions

Comments:

Unit 6: Web & Digital Media Pathway
Web & Digital Media

Competency
8. Perform user testing

Performance Standard Condition
Competence will be demonstrated
- at the worksite

Performance Standard Criteria
Performance will be successful when the learner:
- Performs user testing throughout the design and development process
- Implements a test plan for the web/digital communication product
- Performs usability tests
    - Assess product effectiveness
    - Test product for reliability
- Plans and coordinates customer acceptance testing
- Resolves product problems
    - Define the problem
    - Identify/test possible solutions
    - Develop resolution plan
    - Implement solution
- Documents all phases and issues of user testing

Learning Objectives
- Explain the role of browsers in reading files on the World Wide Web (text-only, hypertext)
- Identify how different browsers affect the look of a web page
- Demonstrate knowledge of the characteristics and uses of plug-ins
- Describe how bandwidth affects data transmission and on-screen image
- Demonstrate knowledge of how bandwidths affect data transmission and on-screen image
- Compare and contrast clients and servers
- Differentiate between a client and a server

Comments:

Unit 6: Web & Digital Media Pathway
Web & Digital Media

Competency
9. Assist to finalize a website

Performance Standard Condition
Competence will be demonstrated
- at the worksite
- while assisting a worksite professional

Performance Standard Criteria
Performance will be successful when the learner:
- Establishes and registers a domain name
- Posts completed site to internet server
- Complies with TCP/IP (Transfer Control Protocol/Internet Protocol)
- Documents server environment to include specifications, passwords, and software versions
- Uses FTP software as needed to support website
- Submits completed site to search engines

Learning Objectives
- Compare domain name registries and extensions
- Explain the DNS (domain name server) hierarchy
- Identify elements of DNS (e.g., zones, server types)
- Compare the advantages and disadvantages of running your own server vs. using a server provider
- Identify hardware requirements for a server
- Identify server software options
- Evaluate server providers
- Describe issues of browser/server compatibility, including which browsers and servers work well together and which ones do not
- Describe Internet protocols
- Explain Transmission Control Protocol/Internet Protocol (TCP/IP) suite
- Explain the concept of routing
- Describe search engine management (SEM) and search engine optimization (SEO)
- Explain the use of transfer protocols (FTP, WebDav)
- Identify cross-platform issues
- Discuss new and emerging trends related to the Internet
- Define the purpose and use of Web 2.0
- Explain concepts involved in social networking
- Describe applications and services used to create rich internet applications
- Identify Web 2.0 solutions

Comments:

Unit 6: Web & Digital Media Pathway
Web & Digital Media

Competency
10. Assist to maintain a website

Performance Standard Condition
Competence will be demonstrated
- at the worksite
- while assisting a worksite professional

Performance Standard Criteria
Performance will be successful when the learner:
- Makes changes to the site as directed by client
- Analyzes software technical support needs
    o Identify maintenance and support requirements
    o Define scope of work to meet customer support needs
- Accesses needed information using appropriate reference materials
- Provides help to first line user-support personnel to answer user questions
- Assists to troubleshoot hardware, access and usability issues
- Performs system-tuning function
- Performs product maintenance activities
    o Upload files to the server
    o Publicize the site (e.g., submit announcements to major search engines)
    o Collect/analyze usage statistics
    o Utilize back-up and restore software features
- Follows established procedures for testing, identifying problems, and tracking resolutions
    o Identify and analyze problem
    o Analyze and propose solutions
    o Implement solutions in code and documentation
- Uses customer satisfaction in determining product characteristics (e.g., cost, user-friendliness)
- Communicates and documents technical support provided

Learning Objectives
- Describe the relationship between dependability, functionality, ease of use, etc.
- Summarize Internet security issues and systems available for addressing them
- Explain data communication equipment and media
- List common uses of data communication equipment
- Compare types of communications media
- Explain data transmission codes and protocols
- Demonstrate knowledge of data transmission codes and protocols
- Explain the differences between local and wide area networks
- Summarize data communication trends and issues
- Identify major current issues in data communications
- Identify the relationship between computer networks and other communications networks (e.g., Telephone Network), and the Internet
Comments:

Unit 6: Web & Digital Media Pathway
Web & Digital Media

Competency
11. Participate on website/digital media project team

Performance Standard Condition
> **Competence will be demonstrated**
> - at the worksite

Performance Standard Criteria
> **Performance will be successful when the learner:**
> - Participates as a team member in the following website/digital media project tasks as able:
>   - Meet with the client to determine purpose of project, scope, target audience requirements, time constraints, design desires, etc
>   - ***Outline structural content***
>   - Design delivery platforms, system architecture, user interface, navigational schema, and coding requirements for site creation including: e-commerce capability, forms and specialized scripts
>   - Prepare visual design specifications for layout, organization, color, images, video, etc.
>   - Identify technical constraints
>   - Identify available media and content sources
>   - Create sample design
>   - Create final project plan including time line for completion, staffing resources, preliminary project budget, detailed task list, user testing plan, critical milestones, interdependencies, etc.
>   - Obtain client approval on scope of work
>   - ***Create content***
>   - ***Code website/project***
>   - ***Perform user testing***
>   - ***Finalize project***
> - Periodically reviews project progress and results

Learning Objectives
- Explain the purpose and use of project management and collaborative tools
- Identify roles of team members/customers in the project process
- Describe web & media development processes and methodology
- Discuss key elements of functional requirements for web & digital media development
- Discuss nonfunctional requirements for a web & digital media development plan (e.g., security, reliability, support, and documentation)
- Explain the use, structure, and contents of a requirements specification document
- Describe common system analysis issues related to design, testing, implementation, and maintenance

Comments: