

## Information Technology: Network Systems

### Career Pathway Plan of Study for ▶ Learners ▶ Parents ▶ Counselors ▶ Teachers/Faculty

This Career Pathway Plan of Study (based on the Network Systems Pathway of the Information Technology Career Cluster) can serve as a guide, along with other career planning materials, as learners continue on a career path. Courses listed within this plan are only recommended coursework and should be individualized to meet each learner's educational and career goals. \*This Plan of Study, used for learners at an educational institution, should be customized with course titles and appropriate high school graduation requirements as well as college entrance requirements.

| EDUCATION LEVELS   | GRADE  | English/<br>Language Arts                             | Math   | Science                              | Social Studies/<br>Sciences          | Other Required Courses<br>Other Electives<br>Recommended<br>Electives<br>Learner Activities  | *Career and Technical Courses<br>and/or Degree Major Courses for<br>Network Systems Pathway   | SAMPLE<br>Occupations Relating<br>to This Pathway   |
|--|--|---|--|--------------------------------------|--------------------------------------|--|---|---|
| <i>Interest Inventory Administered and Plan of Study Initiated for all Learners</i>  |  |   |  |                                      |                                      |  |   |   |
| SECONDARY  | 9  | English/<br>Language Arts I                           | Algebra I or<br>Geometry   | Earth or Life or<br>Physical Science | World History                        | All plans of study should meet local and state high school graduation requirements and college entrance requirements. Certain local student organization activities are also important including public speaking, record keeping and work-based experiences. | <ul style="list-style-type: none"> <li>• Introduction to Information Technology</li> <li>• Information Technology Applications</li> </ul> | <ul style="list-style-type: none"> <li>▶ Communications Analyst</li> <li>▶ Data Communications Analyst</li> <li>▶ Information Systems Administrator</li> <li>▶ Information Systems Operator</li> <li>▶ Information Technology Engineer</li> <li>▶ Network Administrator</li> <li>▶ Network Architect</li> <li>▶ Network Engineer</li> <li>▶ Network Manager</li> <li>▶ Network Operations Analyst</li> <li>▶ Network Security Analyst</li> <li>▶ Network Specialist</li> <li>▶ Network Technician</li> <li>▶ Network Transport Administrator</li> <li>▶ PC Support Specialist</li> <li>▶ Systems Administrator</li> <li>▶ Systems Engineer</li> <li>▶ Systems Support Leader</li> <li>▶ Technical Support Specialist</li> <li>▶ Telecommunications Network Technician</li> <li>▶ User Support Specialist</li> </ul> |
|  | 10   | English/<br>Language Arts II                          | Geometry or<br>Algebra II  | Biology                              | U.S. History                         |  | <ul style="list-style-type: none"> <li>• Fundamentals of Computer Systems</li> </ul>  |   |
|  | 11   | English/<br>Language Arts III                         | Algebra II or<br>Pre-Calculus or<br>Trigonometry                   | Chemistry                            | Political Science<br>Economics       |  | <ul style="list-style-type: none"> <li>• Introduction to Network Systems</li> </ul>   |   |
|  | <i>College Placement Assessments-Academic/Career Advisement Provided</i> |   |  |                                      |                                      |  |   |   |
|  | 12   | English/<br>Language Arts IV<br>Technical Reading     | Pre-Calculus or<br>Trigonometry<br>AP Calculus or<br>Advanced Math | Applied Physics                      |                                      | <ul style="list-style-type: none"> <li>• Network System Design<br/>(Students are encouraged to have an internship/capstone experience to reinforce workplace skills.)</li> </ul>   |   |   |
| <i>Articulation/Dual Credit Transcribed-Postsecondary courses may be taken/moved to the secondary level for articulation/dual credit purposes.</i> |  |   |  |                                      |                                      |  |   |   |
| POSTSECONDARY  | Year 13  | English<br>Composition<br>English Literature          | Calculus   | Chemistry                            | American<br>Government<br>Psychology | All plans of study need to meet learners' career goals with regard to required degrees, licenses, certifications or journey worker status. Certain local student organization activities may also be important to include.                                   | <ul style="list-style-type: none"> <li>• Network System Installation</li> <li>• Network Administration</li> </ul>                         |   |
|  | Year 14  | Speech/<br>Oral<br>Communication<br>Technical Writing | Computer<br>Applications   | Biological Science<br>Physics        | American History<br>Geography        |  | <ul style="list-style-type: none"> <li>• Network Systems Maintenance and Support</li> </ul>   |   |
|  | Year 15  | Continue courses in the area of specialization.       |  |                                      |                                      |  | <ul style="list-style-type: none"> <li>• Continue Courses in the Area of Specialization</li> </ul>  |   |
|  | Year 16  |   |  |                                      |                                      |  | <ul style="list-style-type: none"> <li>• Complete Network Systems Major (4-Year Degree Program)</li> </ul>                                |   |

### *Creating Your Institution's Own Instructional Plan of Study*

With a team of partners (secondary/postsecondary teachers and faculty, counselors, business/industry representatives, instructional leaders, and administrators), use the following steps to develop your own scope and sequence of career and technical courses as well as degree major courses for your institution's plan of study.

- 1** Crosswalk the Cluster Foundation Knowledge and Skills (available at <http://www.careerclusters.org/goto.cfm?id=92>) to the content of your existing secondary and postsecondary programs/courses.
- 2** Crosswalk the Pathway Knowledge and Skills (available at <http://www.careerclusters.org/goto.cfm?id=51>) to the content of your existing secondary/postsecondary programs and courses.
- 3** Based on the crosswalks in steps 1 and 2, determine which existing programs/courses would adequately align to (cover) the knowledge and skills. These programs/courses would be revised to tighten up any alignment weaknesses and would become a part of a sequence of courses to address this pathway.
- 4** Based on the crosswalks in steps 1 and 2, determine what new courses need to be added to address any alignment weaknesses.
- 5** Sequence the **content** and **learner outcomes** of the existing programs/courses identified in step 3 and new courses identified in step 4 into a course sequence leading to preparation for all occupations within this pathway. (See list of occupations on page 1 of this document.)
- 6** The goal of this process would be a series of courses and their descriptions. The names of these courses would be inserted into the *Career and Technical Courses* column on the Plan of Study on page 1 of this document.
- 7** The SAMPLE on page 4 is a **sample result** of steps 1-6, and these course titles are inserted into the Plan of Study on page 1 of this document.
- 8** Crosswalk your state academic standards and applicable national standards (e.g., for mathematics, science, history, language arts, etc.) to the sequence of courses formulated in step 6.

## Information Technology: Network Systems

### SAMPLE Sequence of Courses for ► Instructional Leaders ► Administrators ► Counselors ► Teachers/Faculty

# SAMPLE

**Below are suggested courses that could result from steps 1-6 above. However, as an educational institution, course titles, descriptions and the sequence will be your own. This is a good model of courses for you to use as an example and to help you jump-start your process. Course content may be taught as concepts within other courses, or as modules or units of instruction.**

**The following courses are based on the Cluster Foundation Knowledge and Skills found at <http://www.careerclusters.org/goto.cfm?id=92>. These skills are reinforced through participation in student organization activities.**

#### #1

*Introduction to Information Technology:* This course introduces the student to the knowledge base and technical skills for all careers in the Information Technology Career Cluster. Learners will study the nature of business and demonstrate knowledge of the functions of information systems in business. Emphasis will be placed on maintaining a safe working environment and on building interpersonal skills needed for working in the IT environment. Students will demonstrate appropriate knowledge and behaviors of legal responsibilities by IT professionals. Students will explore a variety of IT career opportunities and develop a personal career plan to meet their career goals and objectives. This may be taught as a career exploration course in conjunction with other foundation Career Cluster courses.

#### #2

*Information Technology Applications:* Students will use technology tools to manage personal schedules and contact information, create memos and notes, prepare simple reports and other business communications, manage computer operations and file storage, and use electronic mail, Internet applications and GIS to communicate, search for and access information. Students will develop skills related to word processing, database management and spreadsheet applications. Students will demonstrate knowledge of hardware components, classes of software, basic data communications components and trends, and technical knowledge of the Internet including Internet protocols. Students will demonstrate understanding of Internet security issues, how to use and troubleshoot Internet connections including Internet software, how to use virus protection techniques and how to use the Internet to communicate and collaborate. Students will install and configure software programs, demonstrate knowledge of Web page basics, apply knowledge of operating system principles, employ computer system interfaces and demonstrate a basic knowledge of quality assurance concepts.

#### #3

*Fundamentals of Computer Systems:* Students will demonstrate knowledge and problem-solving skills in the area of operating systems and computer hardware. This would include, but not be limited to, storage and drives, system boards, processors, memory, peripherals and networks. Emphasis will be placed on speech and client-oriented communication skills.

**The following course is based on the Cluster Foundation Knowledge and Skills as well as the Pathway Knowledge and Skills found at <http://www.careerclusters.org/goto.cfm?id=51>. These skills are reinforced through participation in student organization activities.**

#### #4

*Introduction to Network Systems:* Students will continue to apply their knowledge of hardware and software components associated with information systems. Students will identify and analyze customer/organizational network system needs and requirements, produce strategies to solve specific network problems and analyze network system interdependencies and constraints. Students will analyze the computer site environment and network security systems, and evaluate the correctness and effectiveness of implementing the network system.

**The following courses expose students to Pathway Knowledge and Skills found at <http://www.careerclusters.org/goto.cfm?id=51> and should include appropriate student activities.**

#### #5

*Network System Design:* Students will demonstrate knowledge of the basics of network architecture by designing a network system. Course content includes basic network classifications and topologies, common network computing platforms, LAN physical media, and network connectivity basis and transmission line applications. Students will demonstrate knowledge of communication standards for networks, WAN systems, network security systems and network operating systems.

#### #6

*Network System Installation:* Students will perform network system installation and configuration. This will include performing software loading and configuration appropriate for system and user applications and adding capability to a software system by recording macros and storing them in the system's library. Students will install LAN management software.

#### #7

*Network Administration:* This course teaches skills in network administration and monitoring of the information/network system. Students will demonstrate knowledge of disaster recovery and business continuance and perform network system administration tasks.

#### #8

*Network Systems Maintenance and Support:* Students will perform network maintenance and user support services by identifying technical support needs. Students will install and configure software upgrades, perform standard computer backup procedures, perform network system maintenance, and troubleshoot problems and data communications.

# Notes

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