



## Arts, A/V Technology and Communications Career Cluster

### Telecommunications Pathway

### Knowledge and Skill Statements

The Pathway Knowledge and Skills Chart describes what all/most learners/workers need to know and be able to do to demonstrate competence within a career pathway. Following the pathway description, there are four sets of knowledge and skill expectations:

|                                              |
|----------------------------------------------|
| A. Foundational Academic Expectations        |
| B. Essential Knowledge and Skills            |
| C. Cluster (Foundation) Knowledge and Skills |
| D. Pathway Knowledge and Skills              |

## PATHWAY DESCRIPTION

*Telecommunications Pathway:* Telecommunications specialists focus on the interaction between computer and communications equipment. Telecommunications equipment is computerized and can communicate a variety of information, including data, graphics and video. The workers who set up and maintain this sophisticated equipment are telecommunications equipment technicians, installers and repairers.

## A. FOUNDATIONAL ACADEMIC EXPECTATIONS

All secondary students should meet their state's academic standards. All Essential Cluster and Pathway Knowledge and Skills are predicated on the assumption that foundational academic skills have been attained. Some knowledge and skill statements will further define critical linkages and applications of academics in the cluster and/or pathway.

|                                              |
|----------------------------------------------|
| A. Foundational Academic Expectations        |
| B. Essential Knowledge and Skills            |
| C. Cluster (Foundation) Knowledge and Skills |
| D. Pathway Knowledge and Skills              |

## B. ESSENTIAL KNOWLEDGE AND SKILLS

The following Essential Knowledge and Skill statements apply to careers in all clusters and pathways. Persons preparing for careers in this pathway should be able to demonstrate these skills in the context of this cluster and pathway.

|                                              |
|----------------------------------------------|
| A. Foundational Academic Expectations        |
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### Essential Topic ESS01

**ACADEMIC FOUNDATIONS:** *Achieve additional academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within a career cluster.*



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**ESS01.01 Complete required training, education, and certification to prepare for employment in a particular career field.**

- ESS01.01.01 Identify training, education and certification requirements for occupational choice.
- ESS01.01.02 Participate in career-related training and/or degree programs.
- ESS01.01.03 Pass certification tests to qualify for licensure and/or certification in chosen occupational area.

**ESS01.02 Demonstrate language arts knowledge and skills required to pursue the full range of post-secondary education and career opportunities.**

- ESS01.02.01 Model behaviors that demonstrate active listening.
- ESS01.02.02 Adapt language for audience, purpose, situation. (i.e. diction/structure, style).
- ESS01.02.03 Organize oral and written information.
- ESS01.02.04 Compose focused copy for a variety of written documents such as agendas, audio-visuals, bibliographies, drafts, forms/documents, notes, oral presentations, reports, and technical terminology.
- ESS01.02.05 Edit copy to create focused written documents such as agendas, audio-visuals, bibliographies, drafts, forms/documents, notes, oral presentations, reports, and technical terminology.
- ESS01.02.06 Comprehend key elements of oral and written information such as cause/effect, comparisons/contrasts, conclusions, context, purpose, charts/tables/graphs, evaluation/critiques, mood, persuasive text, sequence, summaries, and technical subject matter.
- ESS01.02.07 Evaluate oral and written information for accuracy, adequacy/sufficiency, appropriateness, clarity, conclusions/solutions, fact/opinion, propaganda, relevancy, validity, and relationship of ideas.
- ESS01.02.08 Identify assumptions, purpose, outcomes/solutions, and propaganda techniques.
- ESS01.02.09 Predict potential outcomes and/or solutions based on oral and written information regarding trends.
- ESS01.02.10 Present formal and informal speeches including discussion, information requests, interpretation, and persuasive arguments.

**ESS01.03 Demonstrate mathematics knowledge and skills required to pursue the full range of post-secondary education and career opportunities.**

- ESS01.03.01 Identify whole numbers, decimals, and fractions.
- ESS01.03.02 Demonstrate knowledge of basic arithmetic operations such as: addition, subtraction, multiplication, and division.
- ESS01.03.03 Demonstrate use of relational expressions such as equal to, not equal, greater than, less than, etc.
- ESS01.03.04 Apply data and measurements to solve a problem.
- ESS01.03.05 Analyze Mathematical problem statements for missing and/or irrelevant data.
- ESS01.03.06 Construct charts/tables/graphs from functions and data.



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ESS01.03.07 Analyze data when interpreting operational documents.  
**ESS01.04 Demonstrate science knowledge and skills required to pursue the full range of post-secondary and career education opportunities.**

ESS01.04.01 Evaluate scientific constructs including conclusions, conflicting data, controls, data, inferences, limitations, questions, sources of errors, and variables.

ESS01.04.02 Apply scientific methods in qualitative and quantitative analysis, data gathering, direct and indirect observation, predictions, and problem identification.

**Essential Topic ESS02** **COMMUNICATIONS: Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information.**

**ESS02.01 Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice.**

ESS02.01.01 Determine the most appropriate reading strategy for identifying the overarching purpose of a text (i.e. skimming, reading for detail, reading for meaning or critical analysis).

ESS02.01.02 Demonstrate use of content, technical concepts and vocabulary when analyzing information and following directions.

ESS02.01.03 Select the reading strategy or strategies needed to fully comprehend the content within a written document (i.e., skimming, reading for detail, reading for meaning or critical analysis).

ESS02.01.04 Interpret information, data, and observations to apply information learned from reading to actual practice.

ESS02.01.05 Transcribe information, data, and observations to apply information learned from reading to actual practice.

ESS02.01.06 Communicate information, data, and observations to apply information learned from reading to actual practice.

**ESS02.02 Demonstrate use of the concepts, strategies, and systems for obtaining and conveying ideas and information to enhance communication in the workplace.**

ESS02.02.01 Employ verbal skills when obtaining and conveying information.

ESS02.02.02 Record information needed to present a report on a given topic or problem.

ESS02.02.03 Write internal and external business correspondence that conveys and/or obtains information effectively.

ESS02.02.04 Communicate with other employees to clarify workplace objectives.

ESS02.02.05 Communicate effectively with customers and employees to foster positive relationships.



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|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>ESS02.03</b> | <b>Locate, organize and reference written information from various sources to communicate with co-workers and clients/participants.</b> |
| ESS02.03.01     | Locate written information used to communicate with co-workers and customers.                                                           |
| ESS02.03.02     | Organize information to use in written and oral communications.                                                                         |
| ESS02.03.03     | Reference the sources of information.                                                                                                   |
| <b>ESS02.04</b> | <b>Evaluate and use information resources to accomplish specific occupational tasks.</b>                                                |
| ESS02.04.01     | Use informational texts, Internet web sites, and/or technical materials to review and apply information sources for occupational tasks. |
| ESS02.04.02     | Evaluate the reliability of information from informational texts, Internet Web sites, and/or technical materials and resources.         |
| <b>ESS02.05</b> | <b>Use correct grammar, punctuation and terminology to write and edit documents.</b>                                                    |
| ESS02.05.01     | Compose multi-paragraph documents clearly, succinctly, and accurately.                                                                  |
| ESS02.05.02     | Use descriptions of audience and purpose when preparing and editing written documents.                                                  |
| ESS02.05.03     | Use correct grammar, spelling, punctuation, and capitalization when preparing written documents.                                        |
| <b>ESS02.06</b> | <b>Develop and deliver formal and informal presentations using appropriate media to engage and inform audiences.</b>                    |
| ESS02.06.01     | Prepare oral presentations to provide information for specific purposes and audiences.                                                  |
| ESS02.06.02     | Identify support materials that will enhance an oral presentation.                                                                      |
| ESS02.06.03     | Prepare support materials that will enhance an oral presentation.                                                                       |
| ESS02.06.04     | Deliver an oral presentation that sustains listeners' attention and interest.                                                           |
| ESS02.06.05     | Align presentation strategies to the intended audience.                                                                                 |
| ESS02.06.06     | Implement multi-media strategies for presentations.                                                                                     |
| <b>ESS02.07</b> | <b>Interpret verbal and nonverbal cues/behaviors to enhance communication with co-workers and clients/participants.</b>                 |
| ESS02.07.01     | Interpret verbal behaviors when communicating with clients and co-workers.                                                              |
| ESS02.07.02     | Interpret nonverbal behaviors when communicating with clients and co-workers.                                                           |
| <b>ESS02.08</b> | <b>Apply active listening skills to obtain and clarify information.</b>                                                                 |
| ESS02.08.01     | Interpret a given verbal message/information.                                                                                           |
| ESS02.08.02     | Respond with restatement and clarification techniques to clarify information.                                                           |
| <b>ESS02.09</b> | <b>Develop and interpret tables, charts, and figures to support written and oral communications.</b>                                    |



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| ESS02.09.01                      | Create tables, charts, and figures to support written and oral communications.                                                                                                                                     |
| ESS02.09.02                      | Interpret tables, charts, and figures used to support written and oral communication.                                                                                                                              |
| <b>ESS02.10</b>                  | <b>Listen to and speak with diverse individuals to enhance communication skills.</b>                                                                                                                               |
| ESS02.10.01                      | Apply factors and strategies for communicating with a diverse workforce.                                                                                                                                           |
| ESS02.10.02                      | Demonstrate ability to communicate and resolve conflicts within a diverse workforce.                                                                                                                               |
| <b>ESS02.11</b>                  | <b>Exhibit public relations skills to increase internal and external customer/client satisfaction.</b>                                                                                                             |
| ESS02.11.01                      | Communicate effectively when developing positive customer/client relationships.                                                                                                                                    |
| <b>Essential Topic<br/>ESS03</b> | <b>PROBLEM-SOLVING AND CRITICAL THINKING:</b> <i>Solve problems using critical thinking skills (analyze, synthesize, and evaluate) independently and in teams. Solve problems using creativity and innovation.</i> |
| <b>ESS03.01</b>                  | <b>Employ critical thinking skills independently and in teams to solve problems and make decisions (e.g., analyze, synthesize and evaluate).</b>                                                                   |
| ESS03.01.01                      | Identify common tasks that require employees to use problem-solving skills.                                                                                                                                        |
| ESS03.01.02                      | Analyze elements of a problem to develop creative solutions.                                                                                                                                                       |
| ESS03.01.03                      | Describe the value of using problem-solving and critical thinking skills to improve a situation or process.                                                                                                        |
| ESS03.01.04                      | Create ideas, proposals, and solutions to problems.                                                                                                                                                                |
| ESS03.01.05                      | Evaluate ideas, proposals, and solutions to problems.                                                                                                                                                              |
| ESS03.01.06                      | Use structured problem-solving methods when developing proposals and solutions.                                                                                                                                    |
| ESS03.01.07                      | Generate new and creative ideas to solve problems by brainstorming possible solutions.                                                                                                                             |
| ESS03.01.08                      | Critically analyze information to determine value to the problem-solving task.                                                                                                                                     |
| ESS03.01.09                      | Guide individuals through the process of recognizing concerns and making informed decisions.                                                                                                                       |
| ESS03.01.10                      | Identify alternatives using a variety of problem-solving and critical thinking skills.                                                                                                                             |
| ESS03.01.11                      | Evaluate alternatives using a variety of problem-solving and critical thinking skills.                                                                                                                             |
| <b>ESS03.02</b>                  | <b>Employ critical thinking and interpersonal skills to resolve conflicts with staff and/or customers.</b>                                                                                                         |
| ESS03.02.01                      | Analyze situations and behaviors that affect conflict management.                                                                                                                                                  |
| ESS03.02.02                      | Determine best options/outcomes for conflict resolution using critical thinking skills.                                                                                                                            |



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- ESS03.02.03 Identify with others' feelings, needs, and concerns.
- ESS03.02.04 Implement stress management techniques.
- ESS03.02.05 Resolve conflicts with/for customers using conflict resolution skills.
- ESS03.02.06 Implement conflict resolution skills to address staff issues/problems.

**ESS03.03 Identify, write and monitor workplace performance goals to guide progress in assigned areas of responsibility and accountability.**

- ESS03.03.01 Write realistic performance goals, objectives and action plans.
- ESS03.03.02 Monitor performance goals and adjust as necessary.
- ESS03.03.03 Recognize goal achievement using appropriate rewards in the workplace.

- ESS03.03.04 Communicate goal achievement with managers and co-workers.

**ESS03.04 Conduct technical research to gather information necessary for decision-making.**

- ESS03.04.01 Align the information gathered to the needs of the audience.
- ESS03.04.02 Gather technical information and data using a variety of resources.
- ESS03.04.03 Analyze information and data for value to the research objectives.
- ESS03.04.04 Evaluate information and data to determine value to research objectives.

**Essential Topic**  
**ESS04**

**INFORMATION TECHNOLOGY APPLICATIONS:** *Use information technology tools specific to the career cluster to access, manage, integrate, and create information.*

**ESS04.01 Use Personal Information Management (PIM) applications to increase workplace efficiency.**

- ESS04.01.01 Manage personal schedules and contact information.
- ESS04.01.02 Create memos and notes.

**ESS04.02 Employ technological tools to expedite workflow.**

- ESS04.02.01 Use information technology tools to manage and perform work responsibilities.

**ESS04.03 Operate electronic mail applications to communicate within a workplace.**

- ESS04.03.01 Use email to share files and documents.
- ESS04.03.02 Identify the functions and purpose of email systems.
- ESS04.03.03 Use email to communicate within and across organizations.

**ESS04.04 Operate Internet applications to perform workplace tasks.**

- ESS04.04.01 Access and navigate Internet (e.g., use a web browser).
- ESS04.04.02 Search for information and resources.
- ESS04.04.03 Evaluate Internet resources for reliability and validity.

**ESS04.05 Operate writing and publishing applications to prepare business communications.**

- ESS04.05.01 Prepare simple documents and other business communications.
- ESS04.05.02 Prepare reports and other business communications by integrating graphics and other non-text elements.





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|-----------------|-------------------------------------------------------------------------------------------------------|
| ESS04.05.03     | Prepare complex multi-media publications.                                                             |
| <b>ESS04.06</b> | <b>Operate presentation applications to prepare presentations.</b>                                    |
| ESS04.06.01     | Prepare presentations for training, sales and information sharing.                                    |
| ESS04.06.02     | Deliver presentations with supporting materials.                                                      |
| <b>ESS04.07</b> | <b>Employ spreadsheet applications to organize and manipulate data.</b>                               |
| ESS04.07.01     | Create a spreadsheet.                                                                                 |
| ESS04.07.02     | Perform calculations and analyses on data using a spreadsheet.                                        |
| <b>ESS04.08</b> | <b>Employ database applications to manage data.</b>                                                   |
| ESS04.08.01     | Manipulate data elements.                                                                             |
| ESS04.08.02     | Manage interrelated data elements.                                                                    |
| ESS04.08.03     | Analyze interrelated data elements.                                                                   |
| ESS04.08.04     | Generate reports showing interrelated data elements.                                                  |
| <b>ESS04.09</b> | <b>Employ collaborative/groupware applications to facilitate group work.</b>                          |
| ESS04.09.01     | Facilitate group work through management of shared schedule and contact information.                  |
| ESS04.09.02     | Facilitate group work through management of shared files and online information.                      |
| ESS04.09.03     | Facilitate group work through instant messaging or virtual meetings.                                  |
| <b>ESS04.10</b> | <b>Employ computer operations applications to manage work tasks.</b>                                  |
| ESS04.10.01     | Manage computer operations.                                                                           |
| ESS04.10.02     | Manage file storage.                                                                                  |
| ESS04.10.03     | Compress or alter files.                                                                              |
| <b>ESS04.11</b> | <b>Use computer-based equipment (containing embedded computers or processors) to control devices.</b> |
| ESS04.11.01     | Operate computer driven equipment and machines.                                                       |
| ESS04.11.02     | Use installation and operation manuals.                                                               |
| ESS04.11.03     | Troubleshoot computer driven equipment and machines.                                                  |
| ESS04.11.04     | Access support as needed to maintain operation of computer driven equipment and machines.             |

**Essential Topic  
ESS05**

**SYSTEMS:** *Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. Identify how key organizational systems affect organizational performance and the quality of products and services. Understand global context of industries and careers.*

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| <b>ESS05.01</b> | <b>Describe the nature and types of business organizations to build an understanding of the scope of organizations.</b> |
| ESS05.01.01     | List the types and functions of businesses.                                                                             |
| ESS05.01.02     | Describe the types and functions of businesses.                                                                         |
| ESS05.01.03     | Explain the functions and interactions of common departments within a business.                                         |



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**ESS05.02 Implement quality control systems and practices to ensure quality products and services.**

ESS05.02.01 Describe quality control standards and practices common to the workplace.

**Essential Topic  
ESS06**

**SAFETY, HEALTH AND ENVIRONMENTAL:** *Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. Follow organizational policies and procedures and contribute to continuous improvement in performance and compliance.*

**ESS06.01 Implement personal and jobsite safety rules and regulations to maintain safe and healthful working conditions and environments.**

ESS06.01.01 Assess workplace conditions with regard to safety and health.  
ESS06.01.02 Align safety issues with appropriate safety standards to ensure a safe workplace/jobsite.  
ESS06.01.03 Identify safety hazards common to workplaces.  
ESS06.01.04 Identify safety precautions to maintain a safe worksite.  
ESS06.01.05 Select appropriate personal protective equipment as needed for a safe workplace/jobsite.  
ESS06.01.06 Inspect personal protective equipment commonly used for selected career pathway.  
ESS06.01.07 Use personal protective equipment according to manufacturer rules and regulations.  
ESS06.01.08 Employ a safety hierarchy and communication system within the workplace/jobsite.  
ESS06.01.09 Implement safety precautions to maintain a safe worksite.

**ESS06.02 Complete work tasks in accordance with employee rights and responsibilities and employers obligations to maintain workplace safety and health.**

ESS06.02.01 Identify rules and laws designed to promote safety and health in the workplace.  
ESS06.02.02 State the rationale of rules and laws designed to promote safety and health.

**ESS06.03 Employ emergency procedures as necessary to provide aid in workplace accidents.**

ESS06.03.01 Use knowledge of First Aid procedures as necessary.  
ESS06.03.02 Use knowledge of CPR procedures as necessary.  
ESS06.03.03 Use safety equipment as necessary.

**ESS06.04 Employ knowledge of response techniques to create a disaster and/or emergency response plan.**

ESS06.04.01 Complete an assessment of an emergency and/or disaster situation.  
ESS06.04.02 Create an emergency and/or disaster plan.





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| <b>Essential Topic<br/>ESS07</b> | <b>LEADERSHIP AND TEAMWORK: <i>Use leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.</i></b>                                                                                                               |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ESS07.01</b>                  | <b>Employ leadership skills to accomplish organizational goals and objectives.</b>                                                                                                                                                                                      |
| ESS07.01.01                      | Analyze the various roles of leaders within organizations (e.g. contribute ideas; share in building an organization; act as role models to employees by adhering to company policies, procedures, and standards; promote the organization's vision; and mentor others). |
| ESS07.01.02                      | Exhibit traits such as empowerment, risk, communication, focusing on results, decision-making, problem solution, and investment in individuals when leading a group in solving a problem.                                                                               |
| ESS07.01.03                      | Exhibit traits such as compassion, service, listening, coaching, developing others, team development, and understanding and appreciating others when acting as a manager of others in the workplace.                                                                    |
| ESS07.01.04                      | Exhibit traits such as enthusiasm, creativity, conviction, mission, courage, concept, focus, principle-centered living, and change when interacting with others in general.                                                                                             |
| ESS07.01.05                      | Consider issues related to self, team, community, diversity, environment, and global awareness when leading others.                                                                                                                                                     |
| ESS07.01.06                      | Exhibit traits such as innovation, intuition, adaptation, life-long learning and coachability to develop leadership potential over time.                                                                                                                                |
| ESS07.01.07                      | Analyze leadership in relation to trust, positive attitude, integrity, and willingness to accept key responsibilities in a work situation.                                                                                                                              |
| ESS07.01.08                      | Describe observations of outstanding leaders using effective management styles.                                                                                                                                                                                         |
| ESS07.01.09                      | Participate in civic and community leadership and teamwork opportunities to enhance skills.                                                                                                                                                                             |
| <b>ESS07.02</b>                  | <b>Employ organizational and staff development skills to foster positive working relationships and accomplish organizational goals.</b>                                                                                                                                 |
| ESS07.02.01                      | Implement organizational skills when facilitating others' work efforts.                                                                                                                                                                                                 |
| ESS07.02.02                      | Explain how to manage a staff that satisfies work demands while adhering to budget constraints.                                                                                                                                                                         |
| ESS07.02.03                      | Describe how staff growth and development to increase productivity and employee satisfaction.                                                                                                                                                                           |
| ESS07.02.04                      | Organize team involvement within a group environment.                                                                                                                                                                                                                   |
| ESS07.02.05                      | Work with others to develop and gain commitment to team goals.                                                                                                                                                                                                          |
| ESS07.02.06                      | Distribute responsibility and work load fairly.                                                                                                                                                                                                                         |
| ESS07.02.07                      | Model leadership and teamwork qualities to aid in employee morale.                                                                                                                                                                                                      |
| ESS07.02.08                      | Identify best practices for successful team functioning.                                                                                                                                                                                                                |
| ESS07.02.09                      | Explain best practices for successful team functioning.                                                                                                                                                                                                                 |
| <b>ESS07.03</b>                  | <b>Employ teamwork skills to achieve collective goals and use team members' talents effectively.</b>                                                                                                                                                                    |



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| ESS07.03.01 | Work with others to achieve objectives in a timely manner.                                                                                                                            |
| ESS07.03.02 | Promote the full involvement and use of team member's individual talents and skills.                                                                                                  |
| ESS07.03.03 | Employ conflict-management skills to facilitate solutions.                                                                                                                            |
| ESS07.03.04 | Demonstrate teamwork skills through working cooperatively with co-workers, supervisory staff, and others, both in and out of the organization, to achieve particular tasks.           |
| ESS07.03.05 | Demonstrate teamwork processes that provide team building, consensus, continuous improvement, respect for the opinions of others, cooperation, adaptability, and conflict resolution. |
| ESS07.03.06 | Develop plans to improve team performance.                                                                                                                                            |
| ESS07.03.07 | Demonstrate commitment to and a positive attitude toward team goals.                                                                                                                  |
| ESS07.03.08 | Take responsibility for shared group and individual work tasks.                                                                                                                       |
| ESS07.03.09 | Assist team members in completing their work.                                                                                                                                         |
| ESS07.03.10 | Adapt effectively to changes in projects and work activities.                                                                                                                         |
| ESS07.03.11 | Negotiate effectively to arrive at decisions.                                                                                                                                         |

**ESS07.04**      **Establish and maintain effective working relationships with all levels of personnel and other departments in order to accomplish objectives and tasks.**

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|-------------|-----------------------------------------------------------------------------------------------------------------------------------|
| ESS07.04.01 | Build effective working relationships using interpersonal skills.                                                                 |
| ESS07.04.02 | Use positive interpersonal skills to work cooperatively with co-workers representing different cultures, genders and backgrounds. |
| ESS07.04.03 | Manage personal skills to accomplish assignments.                                                                                 |
| ESS07.04.04 | Treat people with respect.                                                                                                        |
| ESS07.04.05 | Provide constructive praise and criticism.                                                                                        |
| ESS07.04.06 | Demonstrate sensitivity to and value for diversity.                                                                               |
| ESS07.04.07 | Manage stress and control emotions.                                                                                               |

**ESS07.05**      **Conduct and participate in meetings to accomplish work tasks.**

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| ESS07.05.01 | Develop meeting goals, objectives and agenda.                            |
| ESS07.05.02 | Assign responsibilities for preparing materials and leading discussions. |
| ESS07.05.03 | Prepare materials for leading discussion.                                |
| ESS07.05.04 | Assemble and distribute meeting materials.                               |
| ESS07.05.05 | Conduct meeting to achieve objectives within scheduled time.             |
| ESS07.05.06 | Demonstrate effective communication skills in meetings.                  |
| ESS07.05.07 | Produce meeting minutes including decisions and next steps.              |
| ESS07.05.08 | Use parliamentary procedure, as needed, to conduct meetings.             |

**ESS07.06**      **Employ mentoring skills to inspire and teach others.**

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| ESS07.06.01 | Use motivational techniques to enhance performance in others. |
| ESS07.06.02 | Provide guidance to enhance performance in others.            |

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| <b>Essential Topic</b><br><b>ESS08</b> | <b>ETHICS AND LEGAL RESPONSIBILITIES:</b> <i>Know and understand the importance of professional ethics and legal responsibilities.</i> |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|

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|-----------------|---------------------------------------------------------------------------------------------------------|
| <b>ESS08.01</b> | <b>Apply ethical reasoning to a variety of workplace situations in order to make ethical decisions.</b> |
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| ESS08.01.01                      | Evaluate alternative responses to workplace situations based on legal responsibilities and employer policies.                                                                                                                 |
| ESS08.01.02                      | Evaluate alternative responses to workplace situations based on personal or professional ethical responsibilities.                                                                                                            |
| ESS08.01.03                      | Identify personal and long-term workplace consequences of unethical or illegal behaviors.                                                                                                                                     |
| ESS08.01.04                      | Explain personal and long-term workplace consequences of unethical or illegal behaviors.                                                                                                                                      |
| ESS08.01.05                      | Determine the most appropriate response to workplace situations based on legal and ethical considerations.                                                                                                                    |
| ESS08.01.06                      | Explain the most appropriate response to workplace situations based on legal and ethical considerations.                                                                                                                      |
| <b>ESS08.02</b>                  | <b>Interpret and explain written organizational policies and procedures to help employees perform their jobs according to employer rules and expectations.</b>                                                                |
| ESS08.02.01                      | Locate information on organizational policies in handbooks and manuals.                                                                                                                                                       |
| ESS08.02.02                      | Discuss how specific organizational policies and procedures influence a specific work situation.                                                                                                                              |
| <b>Essential Topic<br/>ESS09</b> | <b>EMPLOYABILITY AND CAREER DEVELOPMENT: <i>Know and understand the importance of employability skills. Explore, plan, and effectively manage careers. Know and understand the importance of entrepreneurship skills.</i></b> |
| <b>ESS09.01</b>                  | <b>Identify and demonstrate positive work behaviors and personal qualities needed to be employable.</b>                                                                                                                       |
| ESS09.01.01                      | Demonstrate self-discipline, self-worth, positive attitude, and integrity in a work situation.                                                                                                                                |
| ESS09.01.02                      | Demonstrate flexibility and willingness to learn new knowledge and skills.                                                                                                                                                    |
| ESS09.01.03                      | Exhibit commitment to the organization.                                                                                                                                                                                       |
| ESS09.01.04                      | Identify how work varies with regard to site, from indoor confined spaces to outdoor areas, including aerial space and a variety of climatic and physical conditions.                                                         |
| ESS09.01.05                      | Apply communication strategies when adapting to a culturally diverse environment.                                                                                                                                             |
| ESS09.01.06                      | Manage resources in relation to the position (i.e. budget, supplies, computer, etc).                                                                                                                                          |
| ESS09.01.07                      | Identify positive work-qualities typically desired in each of the career cluster's pathways.                                                                                                                                  |
| ESS09.01.08                      | Manage work roles and responsibilities to balance them with other life roles and responsibilities.                                                                                                                            |
| <b>ESS09.02</b>                  | <b>Develop a personal career plan to meet career goals and objectives.</b>                                                                                                                                                    |



**Arts, A/V Technology and Communications Career Cluster**  
**Telecommunications Pathway**  
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ESS09.02.01      Develop career goals and objectives as part of a plan for future career direction.

ESS09.02.02      Develop strategies to reach career objectives.

**ESS09.03      Demonstrate skills related to seeking and applying for employment to find and obtain a desired job.**

ESS09.03.01      Use multiple resources to locate job opportunities.

ESS09.03.02      Prepare a résumé.

ESS09.03.03      Prepare a letter of application.

ESS09.03.04      Complete an employment application.

ESS09.03.05      Interview for employment.

ESS09.03.06      List the standards and qualifications that must be met in order to enter a given industry.

ESS09.03.07      Employ critical thinking and decision-making skills to exhibit qualifications to a potential employer.

**ESS09.04      Maintain a career portfolio to document knowledge, skills and experience in a career field.**

ESS09.04.01      Select educational and work history highlights to include in a career portfolio.

ESS09.04.02      Produce a record of work experiences, licenses, certifications and products.

ESS09.04.03      Organize electronic or physical portfolio for use in demonstrating knowledge, skills and experiences.

**ESS09.05      Demonstrate skills in evaluating and comparing employment opportunities in order to accept employment positions that match career goals.**

ESS09.05.01      Compare employment opportunities to individual needs and career plan objectives.

ESS09.05.02      Evaluate employment opportunities based upon individual needs and career plan objectives.

ESS09.05.03      Demonstrate appropriate methods for accepting or rejecting employment offers.

**ESS09.06      Identify and exhibit traits for retaining employment to maintain employment once secured.**

ESS09.06.01      Model behaviors that demonstrate reliability and dependability.

ESS09.06.02      Maintain appropriate dress and behavior for the job to contribute to a safe and effective workplace/jobsite.

ESS09.06.03      Complete required employment forms and documentation such as I-9 form, work visa, W-4 and licensures to meet employment requirements.

ESS09.06.04      Summarize key activities necessary to retain a job in the industry.

ESS09.06.05      Identify positive work behaviors and personal qualities necessary to retain employment.



**Arts, A/V Technology and Communications Career Cluster**  
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**ESS09.07**      **Identify and explore career opportunities in one or more career pathways to build an understanding of the opportunities available in the cluster.**

ESS09.07.01      Locate and identify career opportunities that appeal to personal career goals.

ESS09.07.02      Match personal interest and aptitudes to selected careers.

**ESS09.08**      **Recognize and act upon requirements for career advancement to plan for continuing education and training.**

ESS09.08.01      Identify opportunities for career advancement.

ESS09.08.02      Pursue education and training opportunities to acquire skills necessary for career advancement.

ESS09.08.03      Examine the organization and structure of various segments of the industry to prepare for career advancement.

ESS09.08.04      Research local and regional labor (workforce) market and job growth information to project potential for advancement.

ESS09.08.05      Manage employment relations to make career advancements.

**ESS09.09**      **Continue professional development to keep current on relevant trends and information within the industry.**

ESS09.09.01      Use self assessment, organizational priorities, journals, Internet sites, professional associations, peers and other resources to develop goals that address training, education and self-improvement issues.

ESS09.09.02      Read trade magazines and journals, manufacturers' catalogues, industry publications and Internet sites to keep current on industry trends.

ESS09.09.03      Participate in relevant conferences, workshops, mentoring activities and in-service training to stay current with recent changes in the field.

**ESS09.10**      **Examine licensing, certification and credentialing requirements at the national, state and local levels to maintain compliance with industry requirements.**

ESS09.10.01      Examine continuing education requirements related to licensing, certification, and credentialing requirements at the local, state and national levels for chosen occupation.

ESS09.10.02      Examine the procedures and paperwork involved in maintaining and updating licensure, certification and credentials for chosen occupation.

ESS09.10.03      Align ongoing licensing, certification and credentialing requirements to career plans and goals.

**ESS09.11**      **Examine employment opportunities in entrepreneurship to consider entrepreneurship as an option for career planning.**

ESS09.11.01      Describe the opportunities for entrepreneurship in a given industry.

**Essential Topic**  
**ESS10**

**TECHNICAL SKILLS:** *Use of technical knowledge and skills required to pursue careers in all career cluster, including knowledge of design, operation, and maintenance of technological systems critical to the career cluster.*



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**ESS10.01      Employ information management techniques and strategies in the workplace to assist in decision-making.**

ESS10.01.01      Use information literacy skills when accessing, evaluating and disseminating information.

ESS10.01.02      Describe the nature and scope of information management.

ESS10.01.03      Maintain records to facilitate ongoing business operations.

**ESS10.02      Employ planning and time management skills and tools to enhance results and complete work tasks.**

ESS10.02.01      Develop goals and objectives.

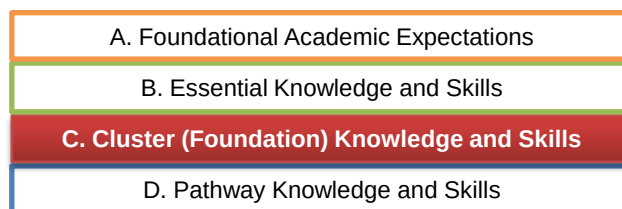
ESS10.02.02      Prioritize tasks to be completed.

ESS10.02.03      Develop timelines using time management knowledge and skills.

ESS10.02.04      Use project-management skills to improve workflow and minimize costs.

**C. CLUSTER (FOUNDATION) KNOWLEDGE AND SKILLS**

The following Cluster (Foundation) Knowledge and Skill statements apply to all careers in the Arts, A/V Technology and Communications Cluster. Persons preparing for careers in the Arts, A/V Technology and Communications Cluster should be able to demonstrate these skills in addition to those found on the Essential Knowledge and Skills Chart.



|                                |                                                                                                                                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cluster Topic<br/>ARC01</b> | <b>ACADEMIC FOUNDATIONS:</b> <i>Achieve additional academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within a career cluster.</i> |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

*No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.*

|                                |                                                                                                                                                                                         |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cluster Topic<br/>ARC02</b> | <b>COMMUNICATIONS:</b> <i>Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information.</i> |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

*No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.*

|                                |                                                                                                                                                                                                                    |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cluster Topic<br/>ARC03</b> | <b>PROBLEM-SOLVING AND CRITICAL THINKING:</b> <i>Solve problems using critical thinking skills (analyze, synthesize, and evaluate) independently and in teams. Solve problems using creativity and innovation.</i> |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

*No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.*





**Arts, A/V Technology and Communications Career Cluster**  
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|                                      |                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Cluster Topic</b><br><b>ARC04</b> | <b>INFORMATION TECHNOLOGY APPLICATIONS:</b> <i>Use information technology tools specific to the career cluster to access, manage, integrate, and create information.</i><br><i>No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.</i>                                                                                                        |
| <b>Cluster Topic</b><br><b>ARC05</b> | <b>SYSTEMS:</b> <i>Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. Identify how key organizational systems affect organizational performance and the quality of products and services. Understand global context of industries and careers.</i>                                                                 |
| <b>ARC05.01</b>                      | <b>Analyze and summarize the history and evolution of the arts, audio-video technology, and communications field to understand the current place the field holds within society and the economy.</b>                                                                                                                                                                                             |
| <b>ARC05.01.01</b>                   | <b>Summarize the history and impact of the arts and technologies on society.</b>                                                                                                                                                                                                                                                                                                                 |
| <i>Sample Indicators</i>             | Develop a timeline depicting the evolution of art, technology, media, and performance to the present time.<br>Identify when the arts became a valued medium within society and how this influenced the arts.<br>Identify positive and negative impacts of the arts on current society.<br>Identify the beginnings of audio-video and communications technologies as valued media within society. |
| <b>ARC05.01.02</b>                   | <b>Evaluate the influences on the evolution of art, technology, media, and performance.</b>                                                                                                                                                                                                                                                                                                      |
| <i>Sample Indicators</i>             | Identify the known influences on the evolution of art, technology, media and performance.<br>Identify key factors that have impacted the evolution of the arts, communications, and audio-video technologies.                                                                                                                                                                                    |
| <b>ARC05.01.03</b>                   | <b>Compare and contrast the different objectives for arts and communications held by the general public and the industry at large.</b>                                                                                                                                                                                                                                                           |
| <i>Sample Indicators</i>             | Analyze the objectives of the general public related to arts and communications.<br>Examine the objectives of industries related to arts and communications operations.<br>Interpret the similarities and differences between the objectives of the general public and the industries relating to arts and communications operations.                                                            |
| <b>ARC05.01.04</b>                   | <b>Analyze current issues related to the arts, audio-video technologies, telecommunications, printing, and the media.</b>                                                                                                                                                                                                                                                                        |
| <i>Sample Indicators</i>             | Identify the current, key, local and national issues for arts and communications technologies.<br>Compare the similarities and differences in the issues currently affecting arts and communications technologies.<br>Determine how these issues impact each area and the entire career cluster.                                                                                                 |
| <b>ARC05.02</b>                      | <b>Examine the various organizational structures adopted by groups within the arts, audio-video, technology, and communications field to understand the diversity and variety of functions within the industry.</b>                                                                                                                                                                              |



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ARC05.02.01 Summarize characteristics of the fluid and diverse nature of organizational structures within the arts, audio-video technology, printing, telecommunications, and media industries.

*Sample Indicators*

- Explain the formal and informal organizational structures within each of these pathways.
- Illustrate the organizational structures in charts.
- Compare the organizational structures of the arts and other pathways for similarities and differences.
- Explain the meaning of diverse organizational structures and why these are important for the accomplishment of joint projects.

**ARC05.03 Analyze the arts, audio-visual technology and communication industry's economic base in order to demonstrate an understanding of the economic factors influencing the industry as a whole.**

ARC05.03.01 Analyze the industry's economic base pertinent to the arts and related technologies.

*Sample Indicators*

- Evaluate how the visual and performing arts economically impacts current society.
- Evaluate how the technology industries economically impact current society.
- Describe how the arts have economically influenced the inception of the technology industry.
- Describe how the technologies industry has influenced the economic growth of the arts to the present time.

ARC05.03.02 Analyze the industry's business practices pertinent to the arts and related technologies.

*Sample Indicators*

- Identify the basic business principles relative to the pathways in this career cluster.
- Examine the business practices amongst the diverse pathways in this career cluster for similarities and differences.

ARC05.03.03 Evaluate the role of the arts in business, technology, and the community.

*Sample Indicators*

- Define the roles of the arts in business, technology, and the community as identified by society.
- Present the role that business expects from the arts in relation to economic development.
- Describe the rationale for technical aspects working with the arts and how this provides a mutual benefit.
- Illustrate roles that the community expects from the arts in relation to quality of life issues.

**ARC05.04 Analyze and summarize evidence of interdependence between the technical and the artistic sides of this career cluster in order to demonstrate an understanding of the systems involved in the cluster.**

ARC05.04.01 Summarize the features of the partnership technology and the arts have in developing presentations and productions.

*Sample Indicators*

- Describe the impact that audio-video technology, printing, broadcasting, and journalism have on the development of presentations and productions.
- Analyze how technical areas and the arts partner to produce high quality presentations and productions.



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ARC05.04.02 Analyze how the roles of creators, performers, technicians, and others are similar and different from one another.

*Sample Indicators*

Analyze the roles of creators, performers, technicians, and others involved in production, performance, and media to identify similarities and differences.  
Analyze the skills required by both technical and artistic partners to provide audiences with quality works and productions.  
Design a presentation that illustrates the similarities and differences of the various roles.

**ARC05.05 Analyze and summarize the formal and informal influences in the abstract and formal structures of business organizations within this cluster to demonstrate an understanding of the influences on holding careers in this field.**

ARC05.05.01 Examine the influence government, public opinion, and diverse local and cultural perspectives may have upon visual arts, media communications, or performance as a business.

*Sample Indicators*

Define influences of government and cultural perspectives as they relate to media communications, visual arts or performance as a business.  
Define the influence of government regulations on media, audio-video productions, telecommunications, printing, and artistic authorship.

Analyze a variety of persistent cultural issues and dilemmas within society that commonly affect how cultures are portrayed within art forms and communication.

Evaluate how cultural issues and dilemmas within society influence government and public opinion and its effects on developing a successful business.

ARC05.05.02 Examine labor management processes and agreements generally used in the arts, audio-video technologies, telecommunications, printing, and media fields.

*Sample Indicators*

Define labor management processes and agreements used within each pathway.  
Identify common labor management processes and agreements used within this career cluster.  
Role play a labor management process as it relates to one area in each pathway in this career cluster.  
Identify issues that are handled in agreements between labor and management in one of the pathways for this cluster.

**Cluster Topic**  
**ARC06**

**SAFETY, HEALTH AND ENVIRONMENTAL:** *Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. Follow organizational policies and procedures and contribute to continuous improvement in performance and compliance.*

**ARC06.01 Maintain safe and healthful working conditions by completing work tasks in accordance with rights and applicable responsibilities in a arts, audio-visual technology and communications work environment to protect employees' well being.**

ARC06.01.01 Assess workplace conditions with regard to safety and health.

*Sample Indicators*

Identify the types of risk of injury/illness at work.



**Arts, A/V Technology and Communications Career Cluster**  
**Telecommunications Pathway**  
**Knowledge and Skill Statements**

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | Identify those who are susceptible to risk of injury/illness at work.<br>Describe ways to positively impact occupational safety and health.<br>Describe ways to positively impact occupational safety and health.                                                                                                                                                                                                                                                                                                                   |
| ARC06.01.02              | State the implications and rationale for various rules and laws designed to promote safety and health may have on a work environment.                                                                                                                                                                                                                                                                                                                                                                                               |
| <i>Sample Indicators</i> | Identify key rights of employees related to occupational safety and health.<br><br>Identify the responsibilities of employers related to occupational safety and health.<br>Explain the role of government agencies in providing a safe workplace.                                                                                                                                                                                                                                                                                  |
| <b>ARC06.02</b>          | <b>Assess and control methods to reduce sources of office and worksite accident hazards common in the arts, audio-visual technology and communications industry in order to promote a safe and accident free working environment.</b>                                                                                                                                                                                                                                                                                               |
| ARC06.02.01              | Demonstrate completion of a variety of methods to prevent and correct common hazards.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <i>Sample Indicators</i> | Identify and describe common hazards in the workplace.<br>Identify and describe major sources of information about hazards in the workplace (e.g., MSDS, work procedures, exposure control plans, training materials, labels, and signage).<br>Identify sources of combustible/flammable materials, fire and emergencies to establish a fire safe environment.<br>Interpret safety signs and symbols.                                                                                                                               |
| ARC06.02.02              | Demonstrate personal and group health and safety practices.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <i>Sample Indicators</i> | Identify procedures necessary for maintaining a safe work area.<br>Identify methods to correct common hazards.<br>Identify methods for disposing of hazardous materials.<br><br>Demonstrate principals of safe physical movement to avoid slips, trips, and spills.<br>Inspect and use protective equipment (PPE).                                                                                                                                                                                                                  |
| <b>ARC06.03</b>          | <b>Examine and summarize the responsibilities various entities have for promoting a safe and healthy work environment in order to understanding the roles involved in maintaining acceptable conditions in the arts, technology and communications field.</b>                                                                                                                                                                                                                                                                       |
| ARC06.03.01              | Summarize the individual employee's responsibility for maintaining health and safety in contrast to a supervisor or others.                                                                                                                                                                                                                                                                                                                                                                                                         |
| <i>Sample Indicators</i> | Examine the situations in this career cluster where individuals work independently and are responsible for their own health.<br>Identify the responsibilities an individual has for implementing health practices in relation to electrical and mechanical equipment.<br>Identify the individual's responsibilities for safe and healthful practices when dealing with stage equipment, artist tools, and mechanical equipment.<br>Design a plan for maintaining individual health for work in various pathways within the cluster. |
| ARC06.03.02              | Illustrate situations that demonstrate compliance with OSHA safety regulations and practices related to this cluster.                                                                                                                                                                                                                                                                                                                                                                                                               |
| <i>Sample Indicators</i> | Define the OSHA safety regulations related to this cluster.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |



**Arts, A/V Technology and Communications Career Cluster**  
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**Knowledge and Skill Statements**

Classify critical safety issues and practices identified by OSHA in relation to pathways in this cluster.

Demonstrate using safety procedures required in a specific pathway in this cluster.

ARC06.03.03 Apply MSDS and Hazardous Materials procedures related to handling and disposing of chemicals.

*Sample Indicators*

Analyze health problems that can result from unsafe exposure to chemicals.

Demonstrate the use of knowledge and skills for safe and healthful use of chemicals in various processes in the arts, graphic arts, photography, and technical areas of this career cluster.

ARC06.03.04 Apply Hazardous Materials practices in relation to fire and water hazards, electrical coding, and right-to-know laws regarding hazards.

*Sample Indicators*

Exhibit knowledge of Hazardous Materials practices.

Demonstrate the use of Hazardous Materials practices related to activities in the career cluster.

**ARC06.04 Examine and summarize safety related problems that may result from working with electrical circuits used in this cluster to demonstrate a broad understanding of health and safety concerns.**

ARC06.04.01 Demonstrate safe work habits and procedures for application of electricity and static discharge in relation to all technologies in the career cluster.

*Sample Indicators*

Exhibit proper grounding techniques.

Identify potential electrical hazards on the work site or set.

Demonstrate how to apply CPR and first aid in relation to electrical shock.

Demonstrate basic procedures for safely working with electricity.

**ARC06.05 Apply safety procedures in operating equipment commonly used within the career pathways involved in this cluster to demonstrate a broad understanding of important safety practices.**

ARC06.05.01 Demonstrate the ability to set and use a ladder.

*Sample Indicators*

Set a ladder safely, both with and without equipment.

ARC06.05.02 Demonstrate safety procedures for operating aerial systems.

*Sample Indicators*

Utilize safety procedures to operate an aerial system without individuals on the equipment.

ARC06.05.03 Demonstrate safety procedures when involved with heights.

*Sample Indicators*

Demonstrate how to safely climb poles using steps, gaffs, scaffolding, and ladders.

ARC06.05.04 Apply the safety practices related to printing and graphic arts, telecommunications, performing arts, visual arts, and broadcasting.

*Sample Indicators*

Illustrate the safety practices required in the control room for broadcasting; in a theater with props, sets, costumes, make-up, and lighting; in graphic arts with presses and duplicators; and in telecommunications.



**Arts, A/V Technology and Communications Career Cluster**  
**Telecommunications Pathway**  
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**ARC06.06**      **Examine and summarize the life style implications and physical demands required by work activities common in the arts, audio/visual, technology and communications cluster to demonstrate an broad perspective regarding the nature of work in the industry.**

ARC06.06.01      Summarize the physical preparation needed to maintain the work activities of pathways in this career cluster.

*Sample Indicators*      Demonstrate a warm-up process to prepare the body for various performing arts.  
Demonstrate body mechanics that prevent strain on various parts of the body and voice.  
Illustrate how to recognize stress as a potential safety factor to the body in various movements.  
Demonstrate ergonomic movements related to artistic performance and technical equipment use.

ARC06.06.02      Summarize life style choices required to maintain the work activities of the pathways in this career cluster.

*Sample Indicators*      Apply knowledge of nutrition to meet the body's needs to supply the physical activity required by careers in this cluster.

Interpret the impact of choices regarding nutrition, stress, exercise, and alternative decisions on an individual's ability to sustain a career in performance.

**ARC06.07**      **Demonstrate personal safety habits and procedures while on work-related assignments in various locations beyond the business site to ensure personal safety and well-being.**

ARC06.07.01      Apply personal safety practices required for various pathways within this career cluster.

*Sample Indicators*      Determine the personal safety practices required when gathering news where potential health and safety hazards exist.  
Practice responding to personal safety concerns "on-location," including dangerous wildlife, terrain, extreme weather, or violence.  
Apply safety rules related to motor vehicles and other equipment.

ARC06.07.02      Apply the safety practices required for working away, "on-location," or in an open environment.

*Sample Indicators*      Demonstrate safety practices for environmental elements specific to "on-location" settings, stage sets, graphic and visual arts development, and field work in journalism, telecommunications, or broadcasting.

**Cluster Topic**      **LEADERSHIP AND TEAMWORK: *Use leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.***  
**ARC07**

*No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.*

**Cluster Topic**      **ETHICS AND LEGAL RESPONSIBILITIES: *Know and understand the importance of professional ethics and legal responsibilities.***  
**ARC08**





**Arts, A/V Technology and Communications Career Cluster**  
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**ARC08.01 Exhibit ethical conduct in writing, creating, printing, broadcasting, and performing to uphold high standards for behavior in the industry.**

ARC08.01.01 Analyze ethical principles of decision-making related to clients, customers, fellow workers, and others.

*Sample Indicators* Define professional code of ethics.

Examine the professional code of ethics (e.g., Society of Professional Journalism).  
Identify consequences of non-ethical decision-making on short and long term reputation.

ARC08.01.02 Analyze ethical conduct that provides proper credit to those whose ideas and content have been used.

*Sample Indicators* Illustrate how credit is given for use of copyright materials.  
Identify the consequences in historical examples of both ethical and unethical conduct related to the use of intellectual property.  
Identify current concerns about consumer ethics related to the music and the video industries.  
Identify ethical and unethical conduct in a given work situation.

ARC08.01.03 Analyze ethical standards that apply to the delivery of quality performance and products.

*Sample Indicators* Define ethical standards.  
Examine the problems related to maintaining ethical standards in situations without a clear standard.

ARC08.01.04 Identify ethics involved in the degree of influence media, arts, and performance have upon individuals.

*Sample Indicators* Identify the degree of influence of print, broadcast media, arts, and performance in a given situation.  
Evaluate historic political events and actions instigated through the use of media, print, art, and performance.

ARC08.01.05 Identify the proper use of proprietary information.

*Sample Indicators* Define proprietary information.  
  
Describe why responsibility for ethical influence is a key issue related to this cluster.  
Describe how proprietary information is a concern related to careers in this cluster.  
Evaluate situations to judge the extent to which information is proprietary and whether or not it can be used.

**ARC08.02 Analyze and apply laws affecting arts, technology and communication enterprises to maintain up-to-date compliance with key regulations influencing the industry.**

ARC08.02.01 Analyze the copyright laws in relation to seeking formal permission to use materials.

*Sample Indicators* Identify steps for securing permission to use copyrighted materials.  
Exhibit how credit is given for use of copyrighted materials.  
Define what is original content and when credit does not need to be given.  
Identify the benefits of copyright laws.  
Identify consequences if formal permission is not secured.

ARC08.02.02 Analyze contracts for potential work in career pathways within this cluster.



# Arts, A/V Technology and Communications Career Cluster

## Telecommunications Pathway

### Knowledge and Skill Statements

|                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sample Indicators | Examine different types of contracts.<br>Interpret various types of contracts.                                                                                                                                                                                                                                                                                                                                                                                                                       |
| ARC08.02.03       | Identify essential elements a contract needs to contain for protection of both parties.<br>Analyze state, county, and city codes related to decisions affecting work in this cluster.<br>Identify processes required to obtain local, county, and state permits for building structures and sets, and installing communications mechanisms in various site locations.                                                                                                                                |
| Sample Indicators | Describe relevant statutes for this cluster.<br>Identify agencies and organizations that oversee and enforce these statutes.<br>Identify assistance professional organizations offer for securing permits.                                                                                                                                                                                                                                                                                           |
| ARC08.02.04       | Analyze the First Amendment, FCC, the Freedom of Information Act, libel laws, and other regulations for compliance issues relevant to this cluster.                                                                                                                                                                                                                                                                                                                                                  |
| Sample Indicators | Describe the intent and relationship of the First Amendment to this cluster.<br>Identify FCC Regulations, the Freedom of Information Act, and state statutes and liability laws pertaining to work in this cluster.<br><br>Identify court cases related to this cluster that preserve business and individual rights.<br>Interpret how The Freedom of Information Act affects workers in this cluster.<br>Illustrate instances when the intent of the First Amendment was preserved in recent times. |
| ARC08.02.05       | Analyze the liabilities associated with productions and performances, media, and telecommunications installations.                                                                                                                                                                                                                                                                                                                                                                                   |
| Sample Indicators | Define the term liabilities.<br>Identify examples of potential situations that could pose legal liabilities.<br>Analyze the risk level for work situations related to this cluster.                                                                                                                                                                                                                                                                                                                  |

|                        |                                                                                                                                                                                                                               |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cluster Topic<br>ARC09 | <b>EMPLOYABILITY AND CAREER DEVELOPMENT: <i>Know and understand the importance of employability skills. Explore, plan, and effectively manage careers. Know and understand the importance of entrepreneurship skills.</i></b> |
| ARC09.01               | <b>Explain written organizational policies, rules and procedures common to careers in arts, AV, technology and communication fields to help employees perform their jobs.</b>                                                 |
| ARC09.01.01            | Locate appropriate information on organizational policies in handbooks and manuals.                                                                                                                                           |
| Sample Indicators      | Identify the contents of various organizational publications.<br>Select the appropriate document (s) as reference for a given situation.                                                                                      |
| ARC09.01.02            | Discuss how specific organizational policies and rules influence a specific work situation.                                                                                                                                   |
| Sample Indicators      | Locate and identify specific organizational policy, rule or procedure to assist with a given situation.<br><br>Explain specific organizational policy, rule or procedure to improve a given situation.                        |



**Arts, A/V Technology and Communications Career Cluster**  
**Telecommunications Pathway**  
**Knowledge and Skill Statements**

**ARC09.03**      **Identify, examine and select career opportunities in one or more arts, AV, technology and communication related career pathways in order to explore career options.**

- ARC09.03.01      Locate career opportunities that appeal to personal career goals.  
*Sample Indicators*      Locate and interpret career information for at least one career cluster.  
      Identify job requirements for career pathways.
- Identify educational and credentialing requirements for career cluster and pathways.
- ARC09.03.02      Match personal interests and aptitudes to selected careers.  
*Sample Indicators*      Identify personal interests and aptitudes.  
      Identify job requirements and characteristics of selected careers.  
      Compare personal interests and aptitudes with job requirements and characteristics of career selected.  
      Modify career goals based on results of personal interests and aptitudes with career requirements and characteristics.

**Cluster Topic**  
**ARC10**

**TECHNICAL SKILLS:** *Use the technical knowledge and skills required to pursue the targeted careers for all pathways in the career cluster, including knowledge of design, operation, and maintenance of technological systems critical to the career cluster.*

**ARC10.01**      **Demonstrate the use of technical knowledge and skills that relate to pathways in this cluster to allow for mobility among numerous career options within the family of related occupations.**

- ARC10.01.01      State how various pathways within the cluster work together to generate productions, media, and other activities.  
*Sample Indicators*      Identify work activities associated with a variety of the cluster pathways required for a theater production, film, television broadcast, or arts event.
- Generate a production, media, or other event, and identify the interrelated activities and skill requirements associated with various pathways in this cluster.
- ARC10.01.02      Identify pathways with common knowledge and skills that provide a worker with the potential for mobility.  
*Sample Indicators*      Compare the pathways for common knowledge and skills, and produce a crosswalk of related career potential.  
      Identify the pathways with the most discrete knowledge and skills, and compare the potential for career crosswalks.

**ARC10.02**      **Summarize knowledge of the systems within various pathways contained in the cluster to keep abreast of new technological advancements and tools important to work in this industry.**

- ARC10.02.01      Analyze the technological systems that are apparent within the various pathways in this cluster.  
*Sample Indicators*      Compare the organizational structures of businesses in each of the pathways in this cluster.
- Identify the technological systems and their effects on the pathways in this cluster.  
      Predict and highlight technological advancements for several pathways to illustrate the effect on work in careers in this cluster.



## Arts, A/V Technology and Communications Career Cluster

### Telecommunications Pathway

### Knowledge and Skill Statements

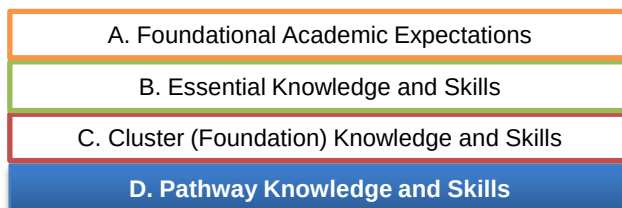
ARC10.02.02 Research the impact of potential new technology advancements related to this cluster in the future.

*Sample Indicators*

Develop a research paper, media production, or other event to demonstrate the impact of technology on careers in this cluster for the future.  
Evaluate the business opportunities in this cluster and identify how these will be impacted by technological advancements and systems.  
Identify the technological changes in the past five years that have affected the skill requirements for workers in this cluster.

## D. PATHWAY KNOWLEDGE AND SKILLS

The following knowledge and skill statements apply to all careers in the Telecommunications Pathway.



| Pathway Topic            | TELECOMMUNICATIONS                                                                                                                                                                                                      |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ARPE01                   |                                                                                                                                                                                                                         |
| ARPE01.01                | <b>Demonstrate the use of industry-specific terminology, tools and test equipment related to telecommunications in order to deliver services commonly offered within this pathway.</b>                                  |
| ARPE01.01.01             | Define terms utilized in direct, alternating current and digital technology.                                                                                                                                            |
| <i>Sample Indicators</i> | Identify terms as utilized in telecommunications.<br>Construct AC and DC circuits.<br>Use AC and DC terminology.<br>Apply logical and systematic approach to troubleshooting network devices.                           |
| ARPE01.01.02             | Demonstrate use and care of hand and power tools.                                                                                                                                                                       |
| <i>Sample Indicators</i> | Identify hand and power tools.<br>Explain use and care of hand and power tools.<br>Practice industry established procedures for use of hand and power tools.                                                            |
| ARPE01.01.03             | Demonstrate use and care of test equipment.                                                                                                                                                                             |
| <i>Sample Indicators</i> | Examine varieties of test equipment for specific uses.<br>Apply use and care principles to testing equipment.<br>Select specific test equipment.<br>Use test equipment.                                                 |
| ARPE01.02                | <b>Describe the characteristics of analog and digital technologies applications for telecommunications in order to build an understanding of the basic technologies used to deliver services within this pathway.</b>   |
| ARPE01.02.01             | Analyze analog circuit and digital logic devices.                                                                                                                                                                       |
| <i>Sample Indicators</i> | Apply logical and systematic approach to troubleshooting analog and digital devices.<br>Construct analog to digital and digital to analog devices.<br>Demonstrate understanding of frequency and spectrum measurements. |



**Arts, A/V Technology and Communications Career Cluster**  
**Telecommunications Pathway**  
**Knowledge and Skill Statements**

ARPE01.02.02      Demonstrate analog circuit test procedures.  
*Sample Indicators*      Demonstrate how to set-up and operate test equipment for analog circuit tests.  
                                 Use analog circuit test procedures.

ARPE01.02.03      Demonstrate digital signal technology.  
*Sample Indicators*      Identify digital signal technology.  
                                 Analyze varieties of digital signal technology.

**ARPE01.03      Demonstrate installation techniques and processes utilizing telecommunication tools and materials to deliver services commonly offered within this pathway.**

ARPE01.03.01      Demonstrate knowledge of soldering for fasteners and terminals.  
*Sample Indicators*      Identify types of soldering for fasteners and terminals.  
                                 Demonstrate use of fasteners and terminals.  
                                 Demonstrate wire-wrapping techniques.

ARPE01.03.02      Explain strengths and weaknesses associated with using fiber, coaxial, wireless, copper and other mediums to complete installations.  
*Sample Indicators*      Identify installation strengths and weaknesses utilizing a physical layout.  
                                 Define methods for tagging wires and cables of various types.  
                                 Explain testing procedures and terminate as necessary.

**ARPE01.04      Analyze schematics, diagrams, and blueprints using appropriate terms, vocabulary and industry-specific codes and regulations to deliver services offered within this pathway.**

ARPE01.04.01      Interpret industry specific codes and regulations.  
*Sample Indicators*      Analyze codes and regulations.  
                                 Interpret codes and regulations.  
                                 Identify occupationally specific required licenses.  
                                 Demonstrate familiarity with coding and certifying agencies.

ARPE01.04.02      Analyze basic network architecture.  
*Sample Indicators*      Exhibit knowledge of characteristics of network components.  
                                 Analyze frame types and formats for networks.  
                                 Analyze protocols for basic network architecture.  
                                 Exhibit knowledge of packet-switching techniques.

ARPE01.04.03      Interpret schematics, diagrams, blueprints, and network topology maps.

*Sample Indicators*      Identify and use common notations and symbols.  
  
                                 Explain the meanings of symbols, color codes, acronyms, references and maps.  
  
                                 Explain use of schematics, diagrams, and blueprints to construct/assemble equipment.  
                                 Interpret point to point network topologies.

ARPE01.04.04      Demonstrate generating technical documentation.  
*Sample Indicators*      Prepare customer documents used for removal, repair and reinstallation of telecommunications system or components.  
                                 Maintain service documentation library/internal file.  
                                 Demonstrate the ability to document engineering changes.  
                                 Perform complete documentation of maintenance and repair actions.



**Arts, A/V Technology and Communications Career Cluster**  
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**ARPE01.05**      **Employ decision-making and problem-solving techniques when completing repair and replacement procedures to deliver services in the telecommunications industry.**

ARPE01.05.01      Demonstrate knowledge of procedures for network equipment repair.

*Sample Indicators*

Identify procedures needed for network equipment repair.

Select industry-specific procedure for equipment repair.

Demonstrate procedures for equipment repair.

ARPE01.05.02      Analyze replacement procedures considering standard maintenance processes.

*Sample Indicators*

Identify replacement procedures considering standard maintenance processes.

Interpret standard replacement procedures.

Interpret standard industry-specific procedures for maintenance processes.

**ARPE01.06**      **Apply knowledge of telecommunications when providing service and solving problems for customers to maintain high quality customer relationships.**

ARPE01.06.01      Solve customer problems using information related to customer needs.

*Sample Indicators*

Identify information related to customer needs.

Define the problem-solving method to be utilized.

Identify the obstacles to solving a problem and meeting the customer's needs.

Assess each alternative to determine potential solution.

Select service or product related to customer needs.

ARPE01.06.02      Demonstrate customer service that meets the intent of state and national guidelines for consumer rights.

*Sample Indicators*

Identify state and national guidelines for consumer rights of customers.

Apply procedures to provide for consumer rights of customers.

ARPE01.06.03      Explain root cause of problem, time required for repairs, and extent of the service required to solve problem(s).

*Sample Indicators*

Explain technical information in terms that the customer understands.

Apply communication skills with customers involving written, oral, listening and body language.

Explain information in a timely and accurate manner.

Explain the product and/or services that best meet the needs of the customer.

**ARPE01.07**      **Employ knowledge of telecommunications security to build an understanding of protocols involved in maintaining consumer safety.**

ARPE01.07.01      Demonstrate basic understanding of the demands of network security.

*Sample Indicators*

Comprehend the need for security.

Demonstrate understanding of recognized security policies and procedures.

Apply knowledge of the risks to data security.

ARPE01.07.02      Explain how to overcome the problems identified using an analysis of the security risks involved.

*Sample Indicators*

Apply knowledge of telecommunications risks to identify potential areas of concern.

Investigate a potential problem and provide alternatives to provide greater security for the telecommunications situation.





**Arts, A/V Technology and Communications Career Cluster**  
**Telecommunications Pathway**  
**Knowledge and Skill Statements**

**ARPE01.08**      **Employ knowledge of network applications when installing networks at a facility to build an understanding regarding how to deliver network systems.**

- ARPE01.08.01      **Employ knowledge of transmission lines and network connectivity.**  
*Sample Indicators*      Exhibit knowledge of the principles and operation of wire and wireless systems.
- Comprehend the procedures and techniques used with wire and wireless technology.  
Apply principles of operations for wire and wireless systems.
- ARPE01.08.02      **Analyze specific specifications for a facility.**  
*Sample Indicators*      Identify the structure and systems requirements.  
Develop specifications required for a system.  
Analyze installation requirements to identify conflicts.  
Verify specifications and installations requirements.
- ARPE01.08.03      **Explain the standards for communication networks.**  
*Sample Indicators*      Exhibit knowledge of high-speed networks and open system interconnection standards.  
Exhibit knowledge of protocols.
- ARPE01.08.04      **Explain the Local Area Network (LAN) and the Wide Area Network (WAN) systems.**  
*Sample Indicators*      Exhibit knowledge of how Local Area Networks are installed and perform.
- Exhibit knowledge of how voice, data, and video interface in Wide Area Networks.
- ARPE01.08.05      **Demonstrate installation of a network system.**  
*Sample Indicators*      Identify the components required for network installation.  
Develop an installation plan.  
Apply knowledge of operating systems and telecommunication hardware and software to install a system.
- ARPE01.08.06      **Employ troubleshooting knowledge to solve problems.**  
*Sample Indicators*      Apply installation verification processes to ensure network is functioning and operating.  
Exhibit knowledge of potential problem areas and alternative solutions.  
Describe diagnostic tools for use in maintenance and identification of system problems.  
Implement a plan to resolve problem area, identifying the problem, potential solutions, and documentation of resolution.