ACAP

Austin Competency Analysis Profile

Hemodialysis Technician

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What's Inside ?

Preface

Austin Community College would like to express our sincere appreciation to our business, industry, labor, and community partners who donated their time and expertise toward the identification and validation of competencies in the following Austin Competency Analysis Profile.

Introduction

The ACAP (Austin Competency Analysis Profile) initiative comes out of the Curriculum Development Office of Instructional Technology and Distributed Learning at Austin Community College. This initiative is ACC's primary source for Competency-Based Curriculum development, providing a connection between our academic and workforce programs and the needs of business and industry.

The ACAP is a process for analyzing an occupation to develop curriculum. The product is a competency list, employability skills, and academic skill levels that have been developed and validated by subject matter experts who perform the occupation. This list will be used to develop programs that address the needs of business and industry by equipping our students with the entry skills required in a workplace environment.

ACAP Process Overview

What are Austin Competency Analysis Profiles (ACAPs)?

Austin Competency Analysis Profiles (ACAPs) are competency lists for academic and workforce programs verified by expert workers, or Subject Matter Experts. These lists evolve from a well-established job analysis process involving business, industry, labor, and community agency representatives from throughout the Austin area.

How is an Austin Competency Analysis Profile used?

Each ACAP identifies the occupational, academic, and employability skills (or competencies) needed to enter a given occupation or occupational area. The ACAP not only lists the competencies but also clusters those competencies into broader units and details the knowledge, skills, and attitudes (competency builders) needed to perform each competency.

Within the competency list are two levels of items: core and advancing. Core items, which are essential for entry-level employment, are required to be taught—the concept of advancing items will only be introduced to students. Advancing items are those needed beyond entry level in a given occupation, and are designated as "Advanced." If core competencies or competency builders are present in an "Advanced" unit, then they are designated as "Core."

Educational institutions may add as many units, competencies, and/or competency builders as desired to reflect local employment needs, trends, and specialties. Local advisory committees are actively involved in the identification and verification of additional items. Faculty members formulate their courses of study using the varied contents of the ACAP. Faculty also monitor gains using many forms of assessment.

Target Job Titles

ACAP: Hemodialysis Technician

Dialysis Technician

Hemodialysis Technician

Patient Care Technician

Occupational Competencies

The following Occupational Competencies have been identified and verified by a panel of subject matter experts currently employed in the field of Hemodialysis Technician. This panel of experts has determined that these skills will adequately prepare students for *entry level* positions in this field. The *Competencies* are grouped into units. *Competency Builders* are included to help identify the knowledge, skills and attitudes students need to perform each competency. These *Competencies* and *Competency Builders* are designed to be the basis for curriculum development to ensure business and industry input that is relative and meaningful to the workplace. These *Competencies* are intended to include all basic, necessary skills for this occupational area, but may be supplemented with additional competencies as faculty and advisory committee members see the need to do so.

Key Terms:

Competency–an observable and measurable behavior that has a definite beginning and end; can be performed within a limited amount of time; consists of two or more competency builders; and leads to a product, service, or decision.

Competency Builders–the skills, knowledge, and attitudes (written in measurable terms) needed to perform a given competency.

Entry Level–position of employment that requires no previous experience, but may require some training and/or specific skills, knowledge, or attitudes.

ACAP: Hemodialysis Technician

Unit 1	Background and Theory
Unit 2	Preparation
Unit 3	Patient Information
Unit 4	Internal Vascular Access
Unit 5	Initiation of Hemodialysis
Unit 6	Monitoring During Dialysis
Unit 7	Discontinue Treatment
Unit 8	Post Dialysis
Unit 9	Emergencies
Unit 10	Miscellaneous Duties
Unit 11	Professionalism

Sources:

Amgen Advisory Committee for Core Curriculum. *Core Curriculum for the Hemodialysis Technician* (Second Edition). Amgen Inc. 2001

BONENT, Board of Nephrology Examiners Nursing and Technology. "Criteria for College-Based Hemodialysis Programs Becoming BONENT Approved/Accredited". Lenexa, KS. www.goAMP.com/bonent

Enhanced Texas Department of Health Curriculum for Dialysis Technician Training. http://nephron.com

Hemodialysis Technician Occupational Competencies

Unit 1 Background and Knowledge

Competency 1.1 Identify Renal functions

Competency Builders:

1.1.1 Identify the anatomy, physiology and pathophysiology as related to renal functions
1.1.2 Describe the part of fluid/electrolyte and acid/base balance in relation to renal functions
1.1.3 Describe the effects of acute renal failure
1.1.4 Describe the effects of chronic renal failure
1.1.5 Describe the effects/symptoms of uremia
1.1.6 Describe the difference between acute and chronic renal failure
1.1.7 Discuss renal nutrition
1.1.8 Identify the psychosocial aspects of renal failure
1.1.9 Identify common medications (Heparin, Normal Saline, Lidocaine, Mannitol, Hypertonic Saline, Epogen Clacijex, Phenergan Benadryl)

Competency 1.2 Explore dialysis therapies

Competency Builders:

1.2.1 Use definitions and terminology correctly
1.2.2 Outline the history of dialysis
1.2.3 Discuss hemodialyzers
1.2.4 Identify blood and dialysate flow patterns
1.2.5 Explain dialysate
1.2.6 List treatment options
1.2.7 Discuss peritoneal dialysis
1.2.8 Discuss transplantation options
1.2.9 Discuss the hemodialysis principles
1.2.10 Discuss different types of dialyzers (CT190G, F70NR, F80B, F80, Optiflux, etc.)

Competency 1.3 Work with a multidisciplinary team

Competency Builders:

1.3.1 Identify the members of the team (physician, dietician, social worker, nurse, and patient care technician)
1.3.2 Discuss the roles of each member of the team
1.3.3 Discuss the interaction of the members of the team

Competency 1.4 Interpret technical procedures

Competency Builders:
1.4.1 Explain power/water on procedures
1.4.2 Discuss conductivity, temperature, dialyzer, setup/prime
1.4.3 Discuss Reprocessed and Dry dialyzers
1.4.4 Discuss alarm testing
1.4.5 Identify the principles of reuse/reprocessing

Competency 1.5 Identify need for water treatment

Competency Builders:
1.5.1 List risks of unsafe water
1.5.2 Explain various systems and devices used for water treatment
1.5.3 Discuss monitoring of water and AAMI (Association for the Advancement of Medical Instrumentation) standards
1.5.4 Walk through the system

Competency 1.6 Examine the history and theory of dialysis access

Competency Builders:
1.6.1 Explain the history of dialysis access
1.6.2 Identify the progression of A/V (arterial/venous) fistulas
1.6.3 Explain the importance of progress relative to grafts
1.6.4 Identify improvements in catheters (peritoneal catheters, subclavian)

Unit 2 Preparation

Competency 2.1 Wear appropriate PPE

Competency Builders:
2.1.1 Identify needed gear
2.1.2 Glove properly
2.1.3 Adjust apron and face shield to ensure maximum protection
2.1.4 Explain the infection control procedures specific to dialysis

Competency 2.2 Prepare dialysate

Competency Builders:
2.2.1 Establish the absence of disinfectant solution in the machine according to unit policy/procedure
2.2.2 Connect the concentrate lines to the appropriate concentrate containers
2.2.3 Check the temperature of the dialysate
2.2.4 Verify temperature to be within limits established by unit policy/procedure
2.2.5 Test conductivity and pH of dialysate via an independent method after the machine is within proper limits (temperature and pH should be within limits of unit policy/procedure)

Competency 2.3 Assemble the extracorporeal circuit

Competency Builders:
2.3.1 Assemble the needed equipment and supplies
2.3.2 Inspect dialyzer for defects and aesthetic appearance
2.3.3 Place dialyzer in holder
2.3.4 Hang blood lines properly
2.3.5 Attach blood lines to the dialyzer
2.3.6 Put blood pump segment of the arterial line in the blood pump
2.3.7 Connect IV infusion line and normal saline
2.3.8 Prime blood lines and dialyzer per unit procedure/protocol
2.3.9 Assure the extracorporeal system is free from air

Competency 2.4 Test the functional status of monitors and alarms

Competency Builders:
2.4.1 Check air/foam detector
2.4.2 Check blood leak detector
2.4.3 Check venous pressure monitor
2.4.4 Check conductivity alarms
2.4.5 Check temperature alarms
2.4.6 Check dialysate pressure and UF (ultrafiltration) alarms
2.4.7 Set monitors and alarms appropriately

Competency 2.5 Recirculate the extracorporeal circuit per unit protocol

Competency Builders:
2.5.1 Attach Hanson connectors to the dialyzer
2.5.2 Attach venous and arterial transducer lines to machine
2.5.3 Initiate recirculation according to unit protocol

Competency 2.6 Read and check treatment plan related to the dialysis treatment

Competency Builders:
2.6.1 Identify type and size of dialyzer (including reprocessing)
2.6.2 Determine duration of treatment
2.6.3 Identify proper dialysate bath
2.6.4 Determine Heparin dosage
2.6.5 Identify dry/target weight
2.6.6 Identify blood flow rate
2.6.7 Determine dialysate flow rate
2.6.8 Determine labs to be drawn (pre, during, and post dialysis)
2.6.9 Determine medications to be given (pre, during, and post dialysis)
2.6.10 Identify other orders per unit policy

Unit 3 Patient Information

Competency 3.1 Assess patient according to unit policy

Competency Builders:

3.1.1 Ask patient about the status of his/her general physical condition since last dialysis (ask how the patient feels)

3.1.2 Ask questions regarding any patient complaints to find out the onset (location, duration, characteristics of quality, quantity, severity, aggravating factors, related symptoms, treatment/relieving factors, etc.)

3.1.3 Report to the RN as needed

3.1.4 Record and document relevant findings about signs and symptoms in the pre-dialysis admission note

Competency 3.2 Evaluate pre-dialysis

Competency Builders:

3.2.1 Obtain and record pre-dialysis weight

3.2.2 Compare to weight from last treatment

3.2.3 Compare pre-dialysis weight to dry/target weight

3.2.4 Obtain and record vital signs (temperature, pulse—including rhythm, blood pressure—sitting and standing, and respiration)

Competency 3.3 Evaluate the patient's general state of health pre-dialysis

Competency Builders:

3.3.1 Check for obvious signs of shortness of breath, edema, neck vein distention, involuntary movement and anxiety

3.3.2 Observe level of consciousness

3.3.3 Observe speech

3.3.4 Observe emotional status

3.3.5 Inspect skin for petechiae, bruises, hematomas, skin lesions and edema

3.3.6 Document relevant findings in pre-dialysis admission note

3.3.7 Notify RN of abnormal findings or acute changes prior to initiation of treatment per unit protocol

Unit 4 Internal Vascular Access

Competency 4.1 Evaluate the access

Competency Builders:

4.1.1 Inspect access for redness, tenderness, swelling, drainage, infection, previous puncture sites and stage of healing, hematoma or ecchymosis and possible aneurysm formation

4.1.2 Check for thrill or bruit

4.1.3 Check for direction of blood flow in loop graft

4.1.4 Notify RN of any abnormalities prior to initiation of the treatment

Competency 4.2 Access preparation/cannulation

Competency Builders:

4.2.1 Gather equipment and supplies
4.2.2 Follow good hand washing technique
4.2.3 Follow universal precautions and wear PPE
4.2.4 Place barrier towel under extremity
4.2.5 Use aseptic technique in prepping access sites per unit protocol (preps using a circumswab technique)
4.2.6 Prepare needle and tubing
4.2.7 Administer local anesthetic per unit protocol if desired by patient
4.2.8 Perform residual disinfectant test on recirculating saline
4.2.9 Check arterial line/dialyzer for correct patient ID per unit procedure
4.2.10 Obtain "second check" per unit procedure to validate removal of residual sterilant

Competency 4.3 Insert fistula needles per unit procedure

Competency Builders:

4.3.1 Establish patency (check for ease of flow)
4.3.2 Check/observe for infiltration
4.3.3 Release tourniquet, if used, after needles are inserted
4.3.4 Anchor and tape needle securely
4.3.5 Call for assistance if having difficulty with cannulation

Competency 4.4 Draw blood samples per unit procedure if needed

Competency Builders:

4.4.1 Identify appropriate site for blood sample collection
4.4.2 Maintain sterility of cannula set during procedure
4.4.3 Prevent introduction of air into tubing
4.4.4 Reclamp fistula needle after drawing blood

Competency 4.5 Administer prescribed Heparin dose per unit protocol

Competency Builders:

4.5.1 Identify appropriate site for administration of Heparin
4.5.2 Prevent introduction of air into tubing
4.5.3 Reclamp fistula needle after administering Heparin

Unit 5 Initiation of Hemodialysis

Competency 5.1 Prepare for dialysis

Competency Builders:

5.1.1 Replace the fluid in the pre-pump portion of the arterial blood line with fresh saline per unit procedure

5.1.2 Connect arterial cannula set to arterial blood line, securing connection (tape bridge or luer lock as appropriate)

5.1.3 Replace the fluid in the remaining portion of the blood circuit with fresh saline per unit procedure

5.1.4 Connect venous cannula set to venous blood line, securing connection with luer lock

Competency 5.2 Start blood flow at 200 ml/min

Competency Builders:

5.2.1 Assess arterial needle site and arterial line for adequate flow

5.2.2 Assess venous needle site and venous pressure monitors for signs of infiltration

5.2.3 Secure the blood lines

5.2.4 Measure patient's blood pressure

Competency 5.3 Set all monitors and alarms

Competency Builders:

5.3.1 Set arterial and venous pressure limits

5.3.2 Set air/foam detector

5.3.3 Set blood leak detector

Competency 5.4 Increase blood flow rate to prescribed setting

Competency Builders:

5.4.1 Observe patient's access sites

5.4.2 Observe patient's symptoms (i.e., dizziness, nausea, back pain, chest pain, burning in access extremity, spasms, etc.)

Competency 5.5 Finalize prescribed machine settings per unit protocol

Competency Builders:

5.5.1 Set prescribed goal and time to achieve the dry weight

5.5.2 Initiate UF (ultrafiltration)

5.5.3 Set sodium modeling and UF profiling as prescribed

5.5.4 Verify correct dialysate concentrate (electrolyte bath)

5.5.5 Invert dialyzer so the arterial end is "up"

Competency 5.6 Check the entire extracorporeal circuit

Competency Builders:

5.6.1 Check blood lines are attached to the correct fistula needles
5.6.2 Secure all connections
5.6.3 Determine that an adequate amount of normal saline remains in the bag on the IV pole
5.6.4 Set BFR (Blood Flow Rate) and DFR (Dialysate Flow Rate) at the prescribed settings
5.6.5 Check the level of blood in the venous and arterial drip chamber to ensure that it is ¾ full
5.6.6 Check the transducer(s) protector to see if it is dry
5.6.7 Ensure that blood lines are attached securely to the dialyzer
5.6.8 Position the dialyzer with the arterial header/end on top
5.6.9 Set all alarm pressure limits
5.6.10 Set air/foam detector
5.6.11 Check setting on TMP (transmembrane pressure) or UFR (ultrafiltration rate) for the proper setting

Unit 6 Monitoring During Dialysis

Competency 6.1 Evaluate patient throughout the course of treatment

Competency Builders:

6.1.1 Check vital signs (blood pressure and pulse rate)
6.1.2 Follow adequacy of anticoagulation per unit procedure
6.1.3 Observe response to treatment
6.1.4 Note any symptoms or any change in physical or mental status
6.1.5 Recognize early signs of patient's adverse responses to dialysis
6.1.6 Take preventative measures when and where appropriate per unit protocol (i.e., administer Normal Saline, Trendelenberg, etc.)
6.1.7 Report early signs of adverse response to the RN
6.1.8 Check access site (blood leakage, needle placement, swelling, etc.)

Competency 6.2 Monitor Technical parameters dictated by the dialyzer and delivery system used

Competency Builders:

6.2.1 Document observations at regular intervals
6.2.2 Monitor BFR
6.2.3 Monitor DFR
6.2.4 Monitor venous and arterial pressure readings
6.2.5 Monitor TMP (Transmembrane Pressure) and UFR
6.2.6 Observe the patency of the extracorporeal circuit
6.2.7 Check alarm limits and/or conditions
6.2.8 Respond to alarms promptly
6.2.9 Report suspected mechanical problems or machine malfunction immediately to charge RN
6.2.10 Follow RN's instructions

Unit 7 Discontinue Treatment

Competency 7.1 Prepare for discontinuation

Competency Builders:

7.1.1 Gather appropriate supplies
7.1.2 Check for post dialysis lab orders
7.1.3 Verify that patient has completed prescribed dialysis therapy
7.1.4 Notify RN if patient requests to be taken off early
7.1.5 Obtain and record blood pressure

Competency 7.2 Discontinue treatment per unit policy and procedure

Competency Builders:

7.2.1 Use aseptic technique
7.2.2 Follow universal precautions
7.2.3 Wear PPE
7.2.4 Return patient's blood with appropriate amount of saline at appropriate BFR and at minimal UFR or TMP
7.2.5 Clamp arterial and venous blood lines and cannula lines
7.2.6 Check patient's blood pressure, pulse, and temperature
7.2.7 Administer additional saline as needed
7.2.8 Remove needles, applying firm pressure to the access site to ensure cessation of bleeding or oozing
7.2.9 Ensure that patient wears glove on non-access hand while holding own needle sites
7.2.10 Ensure family members are wearing PPE when assisting

Unit 8 Post Dialysis

Competency 8.1 Evaluate treatment

Competency Builders:

8.1.1 Ask patient how he/she feels after treatment
8.1.2 Evaluate for changes in the patient's level of consciousness and state of well-being
8.1.3 Record findings

Competency 8.2 Measure and record patient's information

Competency Builders:

8.2.1 Take blood pressure sitting and standing
8.2.2 Take pulse
8.2.3 Take temperature
8.2.4 Weigh the patient
8.2.5 Record all findings
8.2.6 Check condition of vascular access
8.2.7 Report unstable conditions (as defined by unit protocol) to the charge RN
8.2.8 Discharge patient from unit if vital signs are stable

8.2.9 Document and record information, pertinent findings, and conditions of the patient upon discharge on treatment flow sheet per unit protocol

Competency 8.3 Disassemble and clean equipment

Competency Builders:

8.3.1 Prepare dialyzer (if applicable) for reuse per unit procedure
8.3.2 Dispose of needles, blood tubing, and other treatment-related disposables in appropriate containers per unit policy and procedure
8.3.3 Clean machine, chair and area around patient's station appropriately according to unit policy and procedure prior to admission of another patient
8.3.4 Disinfect machine after serum positive patients or end of shift according to unit protocol
8.3.5 Record disinfectant information on appropriate log(s)

Unit 9 Emergencies

Competency 9.1 Describe the appropriate responses to dialysis related emergencies in the patient

Competency Builders:

9.1.1 Identify symptoms of cardiac or respiratory arrest
9.1.2 Describe the evidence of needle displacement or infiltration
9.1.3 List the indicators of clotting of extracorporeal circuit
9.1.4 Describe a reaction to formaldehyde/renalin
9.1.5 Describe a pyrogen reaction
9.1.6 List indication of hemolysis
9.1.7 Identify symptoms of crenation
9.1.8 Describe the evidence indicating an air embolism

Competency 9.2 Describe the appropriate responses to dialysis related emergencies in the equipment

Competency Builders:

9.2.1 Identify dialyzer blood leak
9.2.2 Describe the procedure to follow during power outage
9.2.3 Describe procedures to follow in the event of equipment failure
9.2.4 Locate cardiac arrest equipment
9.2.5 Use cardiac arrest equipment
9.2.6 Activate manual bypass mechanism in response to water quality levels dropping below 2 mega ohms
9.2.7 Begin terminating dialysis when water quality is below 2 mega ohms

Competency 9.3 Respond to a chloramine emergency

Competency Builders:
9.3.1 Detect chloramines in the water
9.3.2 Activate manual bypass mechanism in response to positive chloramines in water supply
9.3.3 Follow directions of charge nurse and chain of command

Competency 9.4 Describe appropriate response to an emergency situation

Competency Builders:
9.4.1 Recite emergency procedures
9.4.2 Ensure patient safety during emergency situations
9.4.3 Identify an emergency situation (fire, electrical, disaster)
9.4.4 Walk through emergency procedures to remain current with protocol in various situations
9.4.5 Walk through the procedures to follow during power failure
9.4.6 Read/apply MSDS
9.4.7 Use proper protocol and caution during technical procedures (lab work, pre/post work, blood sugar)

Competency 9.5 Follow OSHA Exposure control plan

Competency Builders:
9.5.1 Document with appropriate incident reports (TB)
9.5.2 Follow all infection control procedures
9.5.3 Identify infectious risks to patients
9.5.4 Use appropriate PPE
9.5.5 Identify latex allergies
9.5.6 Follow fire and electrical safety/Emergency and Disaster protocols
9.5.7 Identify safe medical devices
9.5.8 Identify hazardous materials
9.5.9 Handle medical devices and hazardous materials appropriately
9.5.10 Read/apply policy/procedure manual
9.5.11 Apply protocol to situations involving Hepatitis B and C, Tuberculosis and HIV exposure
9.5.12 Apply rules of back safety and ergonomics in the work place

Unit 10 Miscellaneous Duties

Competency 10.1 Monitor blood glucose

Competency Builders:
10.1.1 Perform test per unit protocol
10.1.2 Document results
10.1.3 Report abnormal values to RN
10.1.4 Calibrate meters per unit protocol

Competency 10.2 Calibrate Phoenix Meter

Competency Builders:
10.2.1 Rinse with RO water (reverse osmosis)
10.2.2 Calibrate pH
10.2.3 Calibrate conductivity
10.2.4 Disinfect meter at end of day/shift according to unit protocol

Unit 11 Professionalism

Competency 11.1 Ensure professional conduct

Competency Builders:
11.1.1 Self-monitor conduct
11.1.2 Treat patient records and health care information in a confidential manner
11.1.3 Treat patients, families, visitors, and other staff members with respect and dignity
11.1.4 Identify professional boundaries
11.1.5 Store cell phones and pagers in appropriate areas while in the unit

Competency 11.2 Follow professional protocol according to unit policy and procedures

Competency Builders:
11.2.1 Communicate the patient's emotional, medical, psychological and nutritional concerns to the appropriate RN
11.2.2 Participate in patient care conferences
11.2.3 Interact with other health care team members as indicated and appropriate
11.2.4 Reinforce patient and family education
11.2.5 Apply HIPPA to workplace situations

Competency 11.3 Work with team members in a professional manner

Competency Builders:
11.3.1 Follow principles and procedures of the unit
11.3.2 Identify the importance of each team member
11.3.3 Identify the role of each team member
11.3.4 Follow the chain of command

Employability Competencies

Employability Competencies are underlying skills, including work habits and ethics, essential to the workplace and personal growth. SCANS (Secretary's Commission on Achieving Necessary Skills) are the basis for these competencies and are included in all programs based on an ACAP (Austin Competency Analysis Profile). These skills are taught with the intention of providing the student with a well-rounded understanding of workplace expectations in areas not specific to a particular occupation, in an attempt to develop a valuable employee.

ACAP: Hemodialysis Technician

Unit 1:	Resources
Unit 2:	Interpersonal
Unit 3:	Information
Unit 4:	Systems
Unit 5:	Technology
Unit 6:	Basic Skills
Unit 7:	Thinking Skills
Unit 8:	Personal Qualities

Unit 1: Resources

Competency 1.1 Manage time effectively

Competency Builders:

1.1.1 Select relevant, goal-related activities.
1.1.2 Rank activities in order of importance.
1.1.3 Allocate time to activities
1.1.4 Identify tasks to be completed
1.1.5 Develop and follow an effective, workable schedule based on accurate estimates of such things as importance of tasks, time to complete tasks, time available for completion, and task deadlines, without wasting time
1.1.6 Identify possible impact of schedules on other activities
1.1.7 Evaluate and adjust a schedule

Competency 1.2 Manage money effectively

Competency Builders:

1.2.1 Prepare or use budgets including making cost and revenue forecasts
1.2.2 Record details to track budget performance.
1.2.3 Adjust budget appropriately when needed.
1.2.4 Allocate money to include accurately preparing and using a budget according to a consistent and orderly accounting method
1.2.5 Calculate future budgetary needs based on projected costs and revenues
1.2.6 Track the extent to which actual costs and revenues differ from the estimated budget, and take appropriate and effective action

Competency 1.3 Manage material and facility resources effectively

Competency Builders:

1.3.1 Store resources such as materials, supplies, parts, equipment, space or final products in an order that makes the best use of them
1.3.2 Allocate materials and facility resources to include carefully planning the steps involved in the acquisition, storage, and distribution of resources
1.3.3 Acquire, transport, and store material and facility resources safely and efficiently
1.3.4 Maintain material and facility resources in good condition
1.3.5 Distribute material and resources to the end user

Competency 1.4 Manage human resources efficiently

Competency Builders:

1.4.1 Assess people's knowledge, skills and potential
1.4.2 Identify present and future work load
1.4.3 Match individual talents and workload effectively
1.4.4 Monitor performance and provide feedback actively

Unit 2: Interpersonal Skills

Competency 2.1 Participate as a member of a team

Competency Builders:

2.1.1 Work cooperatively with others
2.1.2 Contribute to group with ideas, suggestions, and efforts
2.1.3 Complete personal share of tasks necessary to complete a project
2.1.4 Encourage team members by listening and responding appropriately to their contributions
2.1.5 Build on individual team members' strengths
2.1.6 Resolve differences for the benefit of the team
2.1.7 Take personal responsibility for accomplishing goals
2.1.8 Challenge existing procedures, policies, or authorities responsibly

Competency 2.2 Teach others

Competency Builders:

2.2.1 Coach or otherwise teach others to apply related concepts and theories to tasks
2.2.2 Convey job information to allow others to see its applicability and relevance to tasks
2.2.3 Identify training needs of others
2.2.4 Assess performance of others
2.2.3 Provide feedback on others' performance in a constructive manner
2.2.4 Provide solutions to observed problems.

Competency 2.3 Serve clients/customers

Competency Builders:

2.3.1 Identify customers/clients expectations through surveys, questions, body language, or expressions.
2.3.2 Communicate and work with clients/customers to satisfy their expectations
2.3.3 Listen actively to customers to avoid misunderstanding and to identify needs
2.3.4 Provide alternatives to clients/customers to satisfy their expectations.
2.3.5 Provide services and goods in a timely, positive manner
2.3.6 Obtain additional resources to satisfy client needs efficiently

Competency 2.4 Exercise leadership

Competency Builders:

2.4.1 Communicate thoughts, feelings, and ideas to justify a position
2.4.2 Motivate and/or convince individuals or groups through encouragement or persuasion
2.4.3 Challenge existing procedures, policies or authorities responsibly.
2.4.4 Use rules/values followed by others
2.4.5 Justify a position logically and appropriately
2.4.6 Consider minority viewpoints in making decisions or taking action

Competency 2.5 Negotiate to arrive at a decision

Competency Builders:

2.5.1 Achieve agreement through exchanging specific resources or resolving divergent interests
2.5.2 Research opposition and the history of the conflict
2.5.3 Set realistic, obtainable goals
2.5.4 Present facts and arguments
2.5.5 Listen to and reflect upon what has been said
2.5.6 Clarify problems and resolve conflicts
2.5.7 Propose and examine possible options
2.5.8 Make reasonable compromises

Competency 2.6 Work with cultural diversity

Competency Builders:

2.6.1 Work with men and women, and a variety of ethnic, social and educational backgrounds
2.6.2 Compare one's own culture and that of others
2.6.3 Respect the rights of others while helping them make cultural adjustments when necessary
2.6.4 Base impression upon individual performance, not stereotypes
2.6.5 Understand concerns of members of other ethnic and gender groups

Unit 3: Information

Competency 3.1 Acquire and evaluate information

Competency Builders:

3.1.1 Pose analytic questions to determine specific information needs
3.1.2 Select appropriate information sources
3.1.3 Determine when new information must be created and do so
3.1.4 Evaluate data for relevance and accuracy

Competency 3.2 Organize and maintain information

Competency Builders:

3.2.1 Organize a variety of information forms or sources in a systemic fashion
3.2.2 Maintain written or other forms of information to keep up-to-date information available in a systemic fashion
3.2.3 Organize information from computer, visual, oral and physical sources in readily accessible formats, such as computerized data bases, spreadsheets, microfiche, video disks, paper files, etc.
3.2.4 Transform data into different formats in order to organize them by the application of various methods such as sorting, classifying, or more formal methods

Competency 3.3 Interpret and communicate information

Competency Builders:

3.3.1 Select information to be communicated
3.3.2 Identify best methods to present information (e.g., overheads, handouts, etc.)
3.3.3 Communicate results to others in desired format
3.3.4 Convey information to others through a variety of means including oral, written, graphic, pictorial or multi-media methods

Competency 3.4 Process information using computer

Competency Builders:

3.4.1 Acquire information from the internet and other computer based resources
3.4.2 Organize information, using spreadsheets, word processor, and data bases effectively
3.4.3 Analyze information to identify trends, make projections, etc.
3.4.4 Enter, modify, retrieve, store and verify data and other information in a computer
3.4.5 Choose format for display (e.g., line graphs, bar graphs, tables, pie charts, narrative)
3.4.6 Convey information into the chosen format
3.4.7 Communicate information using e-mail, list serves, word processor, or other computer based communication functions

Unit 4: Systems

Competency 4.1 Apply appropriate techniques to function within social, organizational, and technological systems to attain goals effectively and ethically

Competency Builders:

4.1.1 Identify dynamics and components of social, organizational and technological systems
4.1.2 Recognize acceptable behavior and attitudes within social, organizational and technological systems
4.1.3 Communicate through acceptable methods to interact with social, organizational, and technological systems effectively, efficiently, and ethically
4.1.4 Recognize how a system's structures relate to goals
4.1.5 Recognize the right of people to ask for information and where to get resources

Competency 4.2 Monitor and correct performance of a system

Competency Builders:

4.2.1 Distinguish trends
4.2.2 Predict impact of actions on system operations
4.2.3 Diagnose deviations in the function of a system/organization
4.2.4 Correct performance through necessary action
4.2.5 Detect deviations from systems intended purpose
4.2.6 Troubleshoot the system
4.2.7 Make changes to the system to rectify system function and to ensure quality of product

Competency 4.3 Improve and design systems

Competency Builders:
4.3.1 Make suggestions to modify or improve existing products or services
4.3.2 Implement approved improvements in systems
4.3.3 Evaluate the benefits of the improvements
4.3.4 Develop/recommend new or alternative system designs based on relevant feedback
4.3.5 Communicate the results of the evaluations

Unit 5: Technology

Competency 5.1 Select appropriate technology

Competency Builders:
5.1.1 Determine the desired results or outcomes and applicable restraints
5.1.2 Visualize the necessary methods and applicable technology
5.1.3 Evaluate specifications
5.1.2 Judge which procedures, tools, machines or programs will produce the desired results.

Competency 5.2 Apply technology to task

Competency Builders:
5.2.1 Set up tools such as machines, computers, and programming systems, using proper procedures, to get desired results
5.2.2 Analyze how different parts of machines interact and how machines interact with broader production systems
5.2.3 Install machines including computers
5.2.4 Interpret machine output accurately
5.2.5 Detect errors from program output

Competency 5.3 Maintain and troubleshoot technology

Competency Builders:
5.3.1 Prevent problems in machines, computers, and other technologies
5.3.2 Identify problems in machines, computers and other technologies
5.3.3 Perform routine maintenance and service of machines, computers, and other technologies
5.3.4 Detect more serious problems
5.3.5 Generate workable solutions to correct deviations
5.3.6 Recognize need for additional help

Unit 6: Basic Skills

Competency 6.1 Read written information in prose and documents, such as manuals, graphs, and schedules with understanding

Competency Builders:

6.1.1 Determine the main idea or essential message
6.1.2 Identify relevant details, facts, and specifications
6.1.3 Infer or locate the meaning of unknown or technical vocabulary
6.1.4 Judge the accuracy, appropriateness, style, and plausibility of reports, proposals, or theories of other writers

Competency 6.2 Communicate thoughts, ideas, information, and messages in writing

Competency Builders:

6.2.1 Record information completely and accurately
6.2.2 Compose and create documents such as letters, directions, manuals, reports, proposals, graphs, and flow charts
6.2.3 Use language, style, organization and format appropriate to the subject matter, purpose, and audience
6.2.3 Include supporting documentation where appropriate
6.2.4 Attend to level of detail
6.2.5 Check, edit, and revise for correct information, appropriate emphasis, form, grammar, spelling, and punctuation

Competency 6.3 Perform arithmetic computations and concepts with appropriate technology and/or paper and pencil to solve simple work problems

Competency Builders:

6.3.1 Perform basic computations
6.3.2 Use basic numerical concepts such as whole numbers and percentages in practical situations
6.3.3 Make reasonable estimates of arithmetic results without a calculator
6.3.4 Use tables, graphs, diagrams, and charts to obtain or convey quantitative information

Competency 6.4 Perform mathematics in a variety of techniques to approach practical problems appropriately

Competency Builders:

6.4.1 Choose appropriate technique to solve problem
6.4.2 Use quantitative data to construct logical explanations for real world situations

6.4.3 Express mathematical ideas and concepts orally and in writing
6.4.4 Predict an event considering the role of chance in the occurrence

Competency 6.5 Listen and react appropriately to verbal messages

Competency Builders:
6.5.1 Receive, attend to, interpret, and respond to verbal messages appropriately
6.5.2 Receive, attend to, interpret, and respond to other cues such as body language appropriately
6.5.3 Listen to comprehend, learn, critically evaluate, appreciate, or support the speaker

Competency 6.6 Deliver oral messages appropriately to listeners

Competency Builders:
6.6.1 Organize ideas and communicates orally as appropriate for the situation and listeners
6.6.2 Participate in conversation, discussion, and group presentations
6.6.3 Select an appropriate medium for conveying a message
6.6.4 Use verbal language and other cues, such as body language, in a way appropriate in style, tone, and level of complexity to the audience and the occasion
6.6.5 Speak clearly and communicate a message
6.6.6 Respond to listener feedback in a way that indicates understanding
6.6.7 Ask questions when needed

Unit 7: Thinking Skills

Competency 7.1 Generate new ideas using creative thinking

Competency Builders:
7.1.1 Change or reshapes goals using nonlinear or unusual connections
7.1.2 Imagine new ideas by combining ideas or information in new ways
7.1.3 Connects seemingly unrelated ideas
7.1.4 Reshape goals in ways that reveal new possibilities

Competency 7.2 Make decisions

Competency Builders:
7.2.1 Specify goals and constraints
7.2.2 Generate alternatives
7.2.3 Consider risks
7.2.4 Evaluate and choose best alternatives

7.2.5 Analyze how personal, family, and social factors influence decisions, behaviors, and lifestyles
7.2.6 Utilize a decision-making process to develop future career goals

Competency 7.3 Apply problem solving skills appropriate to situation

Competency Builders:
7.3.1 Recognize a problem exists (i.e., that there is a discrepancy between what is and what should be)
7.3.2 Identify possible reasons for the problem
7.3.3 Devise and implement a plan of action to resolve the problem
7.3.4 Evaluate and monitor progress
7.3.5 Revise the plan as indicated by the findings
7.3.6 Communicate in both oral and written language while working with others to identify/resolve problems
7.3.7 Reason inductively and deductively to solve problems
7.3.8 Select and apply problem-solving methods

Competency 7.4 See things in the mind's eye

Competency Builders:
7.4.1 Organize and process symbols, pictures, graphs, objects or other information to visualize actual representation (such as a building from blueprints)
7.4.2 Visualize possible options
7.4.3 Communicate visualized options verbally

Competency 7.5 Apply learning strategies to support life-long learning

Competency Builders:
7.5.1 Apply and adapt existing and new knowledge and skills, using learning techniques, in both familiar and changing situations
7.5.2 Evaluate learning style (visual, aural, etc.) to make proper selection of learning techniques
7.5.3 Identify various learning techniques including formal learning strategies (note taking or clustering items that share some characteristics) and informal learning strategies (awareness of unidentified false assumptions that may lead to faulty conclusions)
7.5.4 Make decisions/plans concerning school to work training and future educational needs using relevant resources

Competency 7.6 Apply reasoning to finding solutions or draw conclusions

Competency Builders:
7.6.1 Discover a rule or principle underlying the relationship between two or more objects
7.6.2 Extract rules or principles from a set of objects or a written text
7.6.3 Apply principles to solve problems

7.6.4 Draw conclusion from available information using logic
7.6.5 Apply rules and principles to a new situation
7.6.6 Determine which conclusion is correct when given a set of facts and conclusions
7.6.7 Evaluate alternatives and assess consequences to achieve personal and social goals

Unit 8: Personal Qualities

Competency 8.1 Act responsibly

Competency Builders:
8.1.1 Persevere toward goal attainment with a high level of effort
8.1.2 Set high standards in order to become excellent at doing tasks by setting high standards, paying attention to details, working well and displaying a high level of concentration even when assigned an unpleasant task
8.1.3 Display a high standard of attendance, punctuality, enthusiasm, vitality, and optimism in approaching and completing tasks

Competency 8.2 Exhibit effective self-esteem

Competency Builders:
8.2.1 Maintain a positive view of self and believes in own self-worth
8.2.2 Identify won skill and abilities possessed
8.2.3 Recognize own emotional capacity and needs
8.2.4 Identify/Apply effective ways to handle emotional capacity and needs
8.2.5 Recognize own impression on others

Competency 8.3 Employ appropriate social skills

Competency Builders:
8.3.1 Demonstrate understanding, friendliness, adaptability, empathy and politeness in new and on-going group settings
8.3.2 Assert self in familiar and unfamiliar social situations
8.3.3 Relate well to others
8.3.4 Respond appropriately as the situation requires
8.3.5 Take an interest in what others say and do

Competency 8.4 Manage self

Competency Builders:

8.4.1 Assess own knowledge, skills, and abilities accurately
8.4.2 Set well-defined and realistic personal goals
8.4.3 Monitor progress toward goal attainment
8.4.4 Motivate self through goal achievement
8.4.5 Exhibit self-control and respond to feedback unemotionally and nondefensively
8.4.6 Initiate action

Competency 8.5 Apply integrity and honesty to all matters

Competency Builders:

8.5.1 Recognize situations when faced with making a decision or exhibiting behavior that may break with commonly held personal or societal values
8.5.2 Understand the impact of violating these beliefs and codes on an organization, self, and others
8.5.3 Choose an ethical course of action

WorkKeys® Process Overview

Developed by American College Testing (ACT), the purpose of the Job Profiling process is to identify the level of applied academic skills that, according to business and industry, students must master to qualify for and be successful in their occupation of choice. The results of Job Profile "leveling" can help teachers to better target instruction toward their students' needs.

The WorkKeys component, developed by ACT, measures students' applied academic skills. These academic skills include Applied Mathematics, Locating Information, Reading for Information, Listening, Writing, Teamwork, Observation, and Applied Technology. It is determined during the profile which skills apply to the specific job or occupational area.

The ACAP (Austin Competency Analysis Profile) typically includes one or more of the skills described below. A fourth skill may be identified and included if the subject matter experts agree that it is necessary for entry into the position.

- *Applied Mathematics* measures students' ability to analyze, set-up, and solve math problems typically found in the workplace.

- *Locating Information* measures students' ability to use graphic documents to insert, extract, and apply information (includes charts, graphs, tables, forms, blueprints, maps, and instrument gauges).

- *Reading for Information* measures students' ability to read and understand work-related reading materials (text only—does not including charts, graphs, tables, forms, blueprints, maps, or instrument gauges).

Each WorkKeys assessment is further broken down into four to five levels of achievement, with higher numbers indicating higher achievement in the assessed skill. For each academic skill, the Job Profiling process identifies the level required for successful entry into an occupational area as identified by subject matter experts.

ACT WorkKeys® Skill Levels

Skill Area and Rank	Entry Level	Performance Level
1) Locating Information	4	5
2) Reading for Information	4	5
3) Applied Mathematics	5	5

Entry Level

Refers to the requirements necessary for someone entering into the occupation (without previous on the job experience).

Performance Level

Refers to the level at which an employee would need to function effectively having gained on-the-job knowledge.

Skill Ranking

Refers to the criticality of the skill to the performance of the occupation with the most critical skill indicated with one (1) and higher numbers indicating lower criticality.

Levels of WorkKeys® Defined

The skills needed to achieve each level for WorkKeys academic skills identified in this profile are as follows:

Locating Information

Locating Information measures skill in using information taken from workplace graphics such as diagrams, blueprints, floor plans, tables, forms, graphs, charts, and instrument gauges. There are four levels of complexity, 3 through 6, with Level 3 being the least complex and Level 6 the most complex. The levels build on each other, each incorporating the skills at the preceding levels.

Level 3

- Find one or two pieces of information in elementary workplace graphics, such as simple order forms, bar graphs, tables, flowcharts, and floor plans.
- Fill in one or two pieces of information that are missing from elementary workplace graphics.

Level 4

- Find several pieces of information in these type of graphics.
- Summarize and/or compare information and trends in a single graphic.
- Summarize and/or compare information and trends among more than one workplace graphic, such as a bar chart and a table showing related information.

Level 5

- Summarize and/or compare information and trends in single graphic.
- Summarize and/or compare information and trends among more than one graphic, such as a bar chart and a table showing related information.

Level 6

- Make decisions, draw conclusions, and/or apply information to new situations using several related and complex workplace graphics that contain a great amount of information or have challenging presentations (e.g., very detailed graphs, charts, tables, forms, maps, blueprints, diagrams).

Reading for Information

Reading for Information measures skill in reading and understanding work-related reading materials. There are five levels of complexity, 3 through 7, with Level 3 being the least complex and Level 7 the most complex. Although Level 3 is the least complex, it still represents a level of reading skill well above "no skill at all." The levels build on each other, each incorporating the skills at the preceding levels.

Level 3

- Identify uncomplicated key concepts and simple details.
- Recognize the proper placement of a step in a sequence of events, or the proper time to perform a task.
- Identify the meaning of works that are defined with in a passage.
- Identify the meaning of simple words that are not defined within a passage.
- Recognize the application of instructions, from a passage to situations that are described in the passage.

Level 4

- Identify details that are more subtle than those in Level 3.
- Recognize the application of more complex instructions, some of which involve several steps, to described situations.
- Recognize cause-effect relationships.

Level 5

- Understand the paraphrased definition of specialized words or phrases (jargon or technical terms) defined in these reading materials
- Use jargon or technical terms appropriately in describing situations stated in these reading materials
- Understand the meaning of acronyms defined in these reading materials (an acronym is a work or collection of letters which stands for a longer phrase, such as HMO to mean Health Maintenance Organization).
- Figure out which definition of a word with multiple meanings is appropriate in the context of these reading materials.
- Apply information given in these reading materials to situations that are not directly described, but similar**.**
- Apply instructions or procedures with a number of steps to described situations. These instructions may include conditional (if X happens, then you should do Y).

Level 6

- Recognize the application of jargon or technical terms to new situations.
- Recognize the application of complex instructions to new situations.
- Recognize the less-common meaning of a word with multiple meanings from context.
- Generalize from a passage to situations not described in the passage.
- Identify implied details.
- Explain the rationale behind a procedure, policy, or communication.
- Generalize from a passage to a somewhat similar situation.

Level 7

- Recognize the definitions of difficult, uncommon jargon or technical terms from context.
- Generalize from a passage to situations neither described in nor completely similar to those in a passage.

Applied Mathematics

Applied Mathematics measures skill in applying mathematical reasoning to work-related problems. There are five levels of complexity, 3 through 7, with Level 3 being the least complex and Level 7 the most complex. The levels build on each other, each incorporating the skills at the preceding levels.

Level 3

- Perform basic mathematical operations (addition, subtraction, multiplication, and division) and conversions from one form to another, using whole numbers, fractions, decimals, or percentages.
- Translate simple verbal problems into mathematical equations.
- Directly apply logical information provided to solve problems, including those with measurements and dollars and cents.

Level 4

- Perform one or two mathematical operations (such as addition, subtraction, or multiplication) on several positive or negative numbers. (Division of negative numbers is not covered until Level 5.)
- Add commonly known fractions, decimals, or percentages (e.g., ½, .75, 25%) or add three fractions that share a common denominator.
- Calculate averages, simple ratios, proportions, and rates, using whole numbers and decimals.
- Reorder verbal information before performing calculations.
- Read simple charts or graphs to obtain information needed to solve a problem.

Level 5

- Look up and calculate single-step conversions within English or non-English measurement systems (e.g., converting ounces to pounds or centimeters to meters) or between measurement systems (e.g., converting centimeters to inches).
- Make calculations using mixed unit (e.g., hours and minutes).
- Determine what information, calculations, and unit conversions are needed to find a solution.

Level 6

- Set up problems and do several steps of calculations or conversions.
- Calculate using negative numbers, fractions, ratios, percentages, or mixed numbers (e.g., 12 1/8).
- Transpose a formula before calculating (e.g., 8X = 20 => X = 20/8).
- Look up and use two formulas to change from one unit to another unit within the same system of measurement (e.g., 1 cup = 8 fl oz, 1 quart = 4 cups).
- Find mistakes in calculations, such as those required in lower levels.
- Determine the best deal and perform a further calculation with the result.

Level 7

- Solve problems requiring multiple steps of logic and calculation.
- Solve problems involving more than one unknown, nonlinear functions (e.g., rate of change), and applications of basic statistical concepts (e.g., error of measurement).
- Locate errors in multiple-step calculations.
- Solve problems with unusual content or format, or with incomplete or implicit information

Glossary

ACAP–*Austin Competency Analysis* Profile–a well-established job analysis process unique to Austin Community College involving business, industry, labor, and community agency representatives from throughout the Austin area.

Advanced Competencies–The occupation and academic competencies needed to advance in a given occupation

Competency–an observable and measurable behavior that has a definite beginning and end; can be performed within a limited amount of time; consists of two or more competency builders; and leads to a product, service, or decision.

Competency Builders–The skills, knowledge, and attitudes (written in measurable terms) needed to perform a given competency.

Core Competencies–The essential occupational and academic competencies needed to enter and remain in a given occupation.

Employability Competencies–Underlying skills, abilities, and knowledge as they relate to work ethics, work habits, and personal growth and development.

Entry Level–refers to the requirements necessary for someone entering into the occupation (without previous on the job experience).

Performance Level–refers to the level at which an employee would need to function effectively having gained on-the-job knowledge.

Skill Ranking–Refers to the criticality of the WorkKeys skill to the performance of the occupation with one (1) indicating the most critical skill.

SME–*Subject Matter Expert*–incumbent worker in a given occupation that is knowledgeable about the job.

Target Job Titles–titles that may be assigned to the types of jobs aligned with an ACAP. Possible titles of jobs for which students would qualify with certificates or degrees in the programs based on an ACAP.

WorkKeys Skills–Eight skills, defined by ACT, referring to underlying, academic skills as they relate to the workplace. The skills include *Applied Mathematics, Applied Technology, Locating Information, Reading for Information, Observation, Teamwork, Listening, and Writing.* Each skill has a very specific definition and levels of each skill can be aligned with specific abilities defined at each level. WorkKeys skills are the basis for an occupational analysis system developed by ACT. The WorkKeys analysis is the final part of the overall ACAP report. All ACAPs include *Reading for Information, Locating Information, and Applied Mathematics.* A fourth skill may be included in the profile if the subject matter experts identify a need for it.