COMPETENCY-BASED OCCUPATIONAL FRAMEWORK FOR REGISTERED APPRENTICESHIP

Surgical Technologist

ONET Code: 29-2055.00

RAPIDS Code: 1051CB

Created: August 2018

Updated:

This project has been funded, either wholly or in part, with Federal funds from the Department of Labor, Employment and Training Administration under Contract Number DOL-ETA-15-C-0087. The contents of this publication do not necessarily reflect the views or policies of the Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement of the same by the U.S. Government.

For More Information, Contact:

Diana Elliott, PhD, Senior Research Associate, Urban Institute: delliott@urban.org

Robert Lerman, PhD, Institute Fellow, Urban Institute: rlerman@urban.org

URBAN INSTITUTE · ELEVATE · THE · DEBATE

Acknowledgments

We are grateful to Rebecca Malberg von Loewenfeldt and Neelan Gupta of the Healthcare Career Advancement Program ("H-CAP") for their help with this document. We also thank the many representatives of the health and medical field who contributed to this effort.

Anne Wetmore, MPA
Wetmore & Associates,
Wheaton, IL

Lymus Capehart
USDOL, Alaska Apprenticeship and Training
Alaska

Beth Safran-Mukai, HR Operations
El Camino
Mountain View, CA

Brooke Williams, Surgical Technician
El Camino
Mountain View, CA

Andrew Colley, Operating Room Manager
Kaiser
San Leandro, CA

Steven Gomez, Operating Room Manager
Kaiser
Fremont, CA

Mary Sandman, NCAL Talent Acquisition Leader,
Allied Health – Service Line Manager
Kaiser NCAL Region
Oakland, CA

Rebecca Miller, Workforce Director
SEIU UHW-West
San Francisco, CA

Bill Gilligan, Perioperative Director
Dignity Health
St. Mary's, CA

Sindy Rojas, Surgery Office Coordinator/Shop steward
Dignity Health
St. Mary's, CA

Tamara Stafford, Director of Talent Development
El Camino
Mountain View, CA

Beth Willy, Director of Clinical Education
El Camino
Mountain View, CA

Gustavo Garcia, Steward – Surg Tech
Kaiser
Fremont, CA

Danielle Pollard, Workforce Planning Consultant
Kaiser National Workforce Planning and Development
Oakland, CA

Era Sethi, Regional Recruitment Manager
Kaiser NCAL Region
San Leandro, CA

Terrie Ridgway-Olmos, Regional Contract Specialist
SEIU UHW-West
South San Francisco, CA

Keni Addison, Implementation Specialist
SEIU-UHW Joint Employer Education Fund
Sacramento, CA

Cindy Chambers, Consultant
SEIU-UHW Joint Employer Education Fund

Rebecca Hanson, Executive Director
SEIU-UHW Joint Employer Education Fund
Oakland, CA

Shani Byard, Director of Career Advancement
SEIU-UHW Joint Employer Education Fund
Los Angeles, CA

Scott Goodell, Program Director
SEIU-UHW Joint Employer Education Fund
Los Angeles, CA

Letitia Segura, Assistant Director, Upgrade
SEIU-UHW Joint Employer Education Fund
Los Angeles, CA

Contents

Competency-Based Occupational Frameworks

The Urban Institute, under contract by the U.S. Department of Labor, has worked with employers, subject matter experts, labor unions, trade associations, credentialing organizations and academics to develop Competency-Based Occupational Frameworks (CBOF) for Registered Apprenticeship programs. These frameworks defined the **purpose** of an occupation, the **job functions** that are carried out to fulfill that purpose, the **competencies** that enable the apprentice to execute those job functions well, and the **performance criteria** that define the specific knowledge, skills and personal attributes associated with high performance in the workplace. This organizational hierarchy – Job Purpose – Job Functions – Competencies – Performance Criteria – is designed to illustrate that performing work well requires more than just acquiring discrete knowledge elements or developing a series of manual skills. To perform a job well, the employee must be able to assimilate knowledge and skills learned in various settings, recall and apply that information to the present situation, and carry out work activities using sound professional judgment, demonstrating an appropriate attitude or disposition, and achieving a level of speed and accuracy necessary to meet the employer's business need.

The table below compares the terminology of Functional Analysis with that of traditional Occupational Task Analysis to illustrate the important similarities and differences. While both identify the key technical elements of an occupation, Functional Analysis includes the identification of behaviors, attributes and characteristics of workers necessary to meet an employer's expectations.

Framework Terminology	Traditional Task Analysis Terminology
Job Function – the work activities that are carried out to fulfill the job purpose	Job Duties – roles and responsibilities associated with an occupation
Competency – the actions an individual takes and the attitudes he/she displays to complete those activities	Task – a unit of work or set of activities needed to produce some result
Performance Criteria – the specific knowledge, skills, dispositions, attributes, speed and accuracy associated with meeting the employer's expectations	Sub Task – the independent actions taken to perform a unit of work or a work activity

Although designed for use in competency-based apprenticeship, these Competency-Based Occupational Frameworks also support time-based apprenticeship by defining more clearly and precisely what an apprentice is expected to learn and do during the allocated time-period.

CBOFs are comprehensive to encompass the full range of jobs that may be performed by individuals in the same occupation. As employers or sponsors develop their individual apprenticeship programs, they can extract from or add to the framework to meet their unique organizational needs.

Components of the Competency-Based Occupational Framework

Occupational Overview: This section of the framework provides a description of the occupation including its purpose, the setting in which the job is performed and unique features of the occupation.

Work Process Schedule: This section includes the job functions and competencies that would likely be included in an apprenticeship sponsor's application for registration. These frameworks provide a point of reference that has already been vetted by industry leaders so sponsors can develop new programs knowing that they will meet or exceed the consensus expectations of peers. Sponsors maintain the ability to customize their programs to meet their unique needs, but omission of a significant number of job functions or competencies should raise questions about whether or not the program has correctly identified the occupation of interest.

Cross-cutting Competencies: These competencies are common among all workers, and focus on the underlying knowledge, attitudes, personal attributes and interpersonal skills that are important regardless of the occupation. That said, while these competencies are important to all occupations, the relative importance of some versus others may change from one occupation to the next. These relative differences are illustrated in this part of the CBOF and can be used to design pre-apprenticeship programs or design effective screening tools when recruiting apprentices to the program.

Detailed Job Function Analysis: This portion of the framework includes considerable detail and is designed to support curriculum designers and trainers in developing and administering the program. There is considerable detail in this section, which may be confusing to those seeking a more succinct, higher-level view of the program. For this reason, we recommend that the Work Process Schedule be the focus of program planning activities, leaving the detailed job function analysis sections to instructional designers as they engage in their development work.

a. Related Technical Instruction: Under each job function appears a list of foundational knowledge, skills, tools and technologies that would likely be taught in the classroom to enable the apprentice's on-the-job training safety and success.

b. Performance Criteria: Under each competency, we provide recommended performance criteria that could be used to differentiate between minimally, moderately and highly competent apprentices. These performance criteria are generally skills-based rather than knowledge-based, but may also include dispositional and behavioral competencies.

Using the Competency-Based Occupational Framework to Develop a Registered Apprenticeship Program

When developing a registered apprenticeship program, the Work Process Schedule included in this CBOF provides an overview of the job functions and competencies an expert peer group deemed to be important to this occupation. The Work Process Schedule in this document can be used directly, or modified and used to describe your program content and design as part of your registration application.

When designing the curriculum to support the apprenticeship program – including on the job training and related technical instruction – further information in Detailed Job Functions could be helpful. These more detailed job function documents include recommendations for the key knowledge and skill elements that might be included in the classroom instruction designed to support a given job function, and the performance criteria provided under each competency could be helpful to trainers and mentors in evaluating apprentice performance and insuring inter-rater reliability when multiple mentors are involved.

Surgical Technologist Occupational Overview

Occupational Purpose and Context

Surgical technologists work as members of a healthcare team alongside physicians and surgeons, registered nurses, and other healthcare workers.

Before an operation, surgical technologists prepare the operating room by setting up surgical instruments and equipment. They also prepare patients for surgery by washing and disinfecting incision sites, positioning the patients on the operating table, covering them with sterile drapes, and taking them to and from the operating room. Surgical technologists prepare sterile solutions and medications used in surgery and check that all surgical equipment is working properly. They help the surgical team put on sterile gowns and gloves.

During an operation, surgical technologists pass instruments and supplies to surgeons and first assistants. They also hold retractors, hold internal organs in place during the procedure, or set up robotic surgical equipment. Technologists also may handle specimens taken for laboratory analysis.

Once the operation is complete, surgical technologists may apply bandages and other dressings to the incision site. They may also help transfer patients to recovery rooms and restock operating rooms after a procedure.

Potential Job Titles

Surgical Technologist; Tech in Surgery – Certified; Certified Surgical Technologist; Operating Room Technician

Attitudes and Behaviors

Persons who are successful in becoming surgical technologists possess a strong sense of responsibility, are able to anticipate and respond appropriately to perceived needs without being asked, and have considerable patience and concern for others. Such persons function well in a team, perform accurately and efficiently under pressure, and possess manual dexterity and fine motor coordination.

Other terms to describe attitudes and behaviors of surgical technologists include: *Efficient, emotionally stable, ethical, flexible, able to follow directions, honest, intuitive, organized, hygienic, physically fit, punctual, receptive, reliable, respecting of patient privacy, responsible, possessing a sense of humor.*

Apprenticeship Prerequisites

Surgical Technologists must complete post-secondary training (from a one year program to an Associate's Degree program) and/or have experience as a surgical assistant in a medical or military setting. Surgical technology education programs include courses in anatomy, physiology, biology, medical terminology, pharmacology and anesthesia, microbiology, pathophysiology, and often some technological and other instruction. Previous certification as a surgical technologist, a set number of years of experience as a surgical technologist, and/or military training and experience as a military surgical technologist can qualify a person to take the certification exam for certification renewal, depending on the type of certification. Participation in a training program requires a complete background check, documentation of current required-immunizations and current Healthcare Provider CPR certification.

Occupational Pathways

Some surgical technologists progress to become Surgical First Assistants. Surgical first assistants often work as surgical technologists and receive additional on-the-job training before becoming first assistants. Others may complete a formal education program in surgical assisting.

Surgical first assistants have a hands-on role, directly assisting surgeons during a procedure. For instance, they may help to suction the incision site or suture a wound.

Certifications, Licensure and Other Credential Requirements

CREDENTIAL	Offered By	Before, During or After Apprenticeship
Certified Surgical Technologist (CST)	National Board of Surgical Technology and Surgical Assisting	Before
Tech in Surgery-Cerified: TS-C(NCCT)	National Center For Competency Testing	Before or during

Job Functions

JOB FUNCTIONS		Core or Optional	Level
1.	Prepare for Surgical Procedures	Core	
2.	Perform Intraoperative Duties/Activities	Core	
3.	Perform Postoperative Procedures and Room Turnover	Core	
4.	Assist Circulator	Core	
5.	Recognize and Demonstrate Knowledge of the Maintenance of Surgical Supplies/Equipment	Core	
6.	Provide Safe Environment	Core	
7.	Perform Departmental Responsibilities	Core	
8.	Maintain Professional Responsibility	Core	

Work Process Schedule

WORK PROCESS SCHEDULE Surgical Technologist		ONET Code: 29-2055.00 RAPIDS Code: 1051CB
JOB TITLE: Surgical Technologist		
Company Contact: Name		
Address:	**Phone**	**Email**
Apprenticeship Type: **__X__Competency-Based** **_____Time-Based _____Hybrid**	**Prerequisites** 1-year accreditation program or Associate's Degree Background Check Documentation of Immunizations Current Healthcare Provider CPR certification	

JOB FUNCTION 1: Prepare for Surgical Procedures			
Competencies	Core or	RTI	OJT
A. Prepare the operating room environment according to the surgical procedure	Core		
B. Prepare for the specific procedure	Core		
C. Establish sterile field	Core		
D. Take preoperative precautions	Core		
E. Prepare the patient and surgical team	Core		
F. Participate in surgical time out	Core		

JOB FUNCTION 2: Perform Intraoperative Duties/Activities			
Competencies	Core or Optional	OJT	RTI
A. Maintain the operating room environment according to surgical procedure	Core		
B. Provide the surgical team members with supplies required for the procedure	Core		
C. Assemble and test materials and specialty equipment during surgery	Core		
D. Anticipate needs during surgery	Core		
E. Provide intraoperative assistance when delegated by a surgeon	Core		
F. Handle medications, solutions, and specimens appropriately	Core		
G. Perform closing sponge, needle, and instrument counts	Core		
JOB FUNCTION 3: Perform Postoperative Procedures and Room Turnover			
Competencies	Core or Optional	OJT	RTI
A. Conduct postoperative patient care	Core		
B. Dispose of waste	Core		
C. Conduct room turnover after surgery	Core		
JOB FUNCTION 4: Assist Circulator			
Competencies	Core or Optional	OJT	RTI
A. Assist with/provide patient care	Core		
B. Assist with supplies and equipment	Core		
JOB FUNCTION 5: Recognize and Demonstrate Knowledge of the Maintenance of Surgical Supplies/Equipment			
Competencies	Core or Optional	OJT	RTI
A. Wash and decontaminate instruments	Core		
B. Ultrasound, milk, rinse and dry instruments	Core		

C. Assemble instrument trays	Core		
D. Prepare for and operate sterilizers	Core		
JOB FUNCTION 6: Provide Safe Environment			
Competencies	Core or Optional	OJT	RTI
A. Maintain a safe preoperative environment	Core		
B. Maintain a safe intraoperative environment	Core		
C. Maintain a safe postoperative environment	Core		
D. Practice precautions with critical equipment	Core		
E. Practice general safety precautions	Core		
JOB FUNCTION 7: Perform Departmental Responsibilities			
Competencies	Core or Optional	OJT	RTI
A. Receive/participate in dept. communications	Core		
B. Inventory supplies	Core		
C. Rotate supplies	Core		
D. Order supplies	Core		
E. Create/update surgeon preference cards	Core		
F. Attend inter/intra departmental committees	Core		
G. Maintain cleanliness of department	Core		
JOB FUNCTION 8: Maintain Professional Responsibility			
Competencies	Core	OJT	RTI
A. Maintain institutional competencies	Core		
B. Practice cost containment	Optional		
C. Attend/contribute to in-service classes	Core		
D. Evaluate new equipment	Optional		
E. Precept new employees/students	Core		
F. Participate in performance improvement activities	Core		

Related Technical Instruction Plan

Note: Accredited instruction plans for surgical technologists vary across training institutions. The plan described below is an example of coursework required for a basic degree in Surgical Technology. Other plans, especially those for an Associate Degree in Surgical Technology, can include additional core curricula.

COURSE NAME: GENERAL ANATOMY AND PHYSIOLOGY	**Course Number** **Hours: 60 total**
LEARNING OBJECTIVES	
General Anatomy and Physiology examines basic concepts of human anatomy and physiology as they relate to health sciences. Using a body systems approach, the course emphasizes the interrelationships between structure and function at the gross and microscopic levels of organization, of the entire human body. It is intended to prepare health care professionals who need to apply basic concepts of whole body anatomy and physiology to informed decision-making and professional communication with colleagues and patients.	
COURSE NAME: MEDICAL TERMINOLOGY	**Course Number** **Hours: 45 total**
LEARNING OBJECTIVES	
Medical Terminology focuses on the component parts of medical terms: prefixes, suffixes and word roots. Students practice formation, analysis and reconstruction of terms. Emphasis is on spelling, definition and pronunciation. Introduction to operative, diagnostic, therapeutic and symptomatic terminology of all body systems, as well as systemic and surgical terminology, is included.	
COURSE NAME: WRITTEN COMMUNICATION	**Course Number** **Hours: 45 total**
LEARNING OBJECTIVES	
Written Communication develops writing skills which include prewriting, drafting, revising, and editing. A variety of writing assignments is designed to help the learner analyze audience and purpose, research and organize ideas, and format and design documents based on subject matter and content. Written Communication also develops critical reading and thinking skills through the analysis of a variety of written documents.	

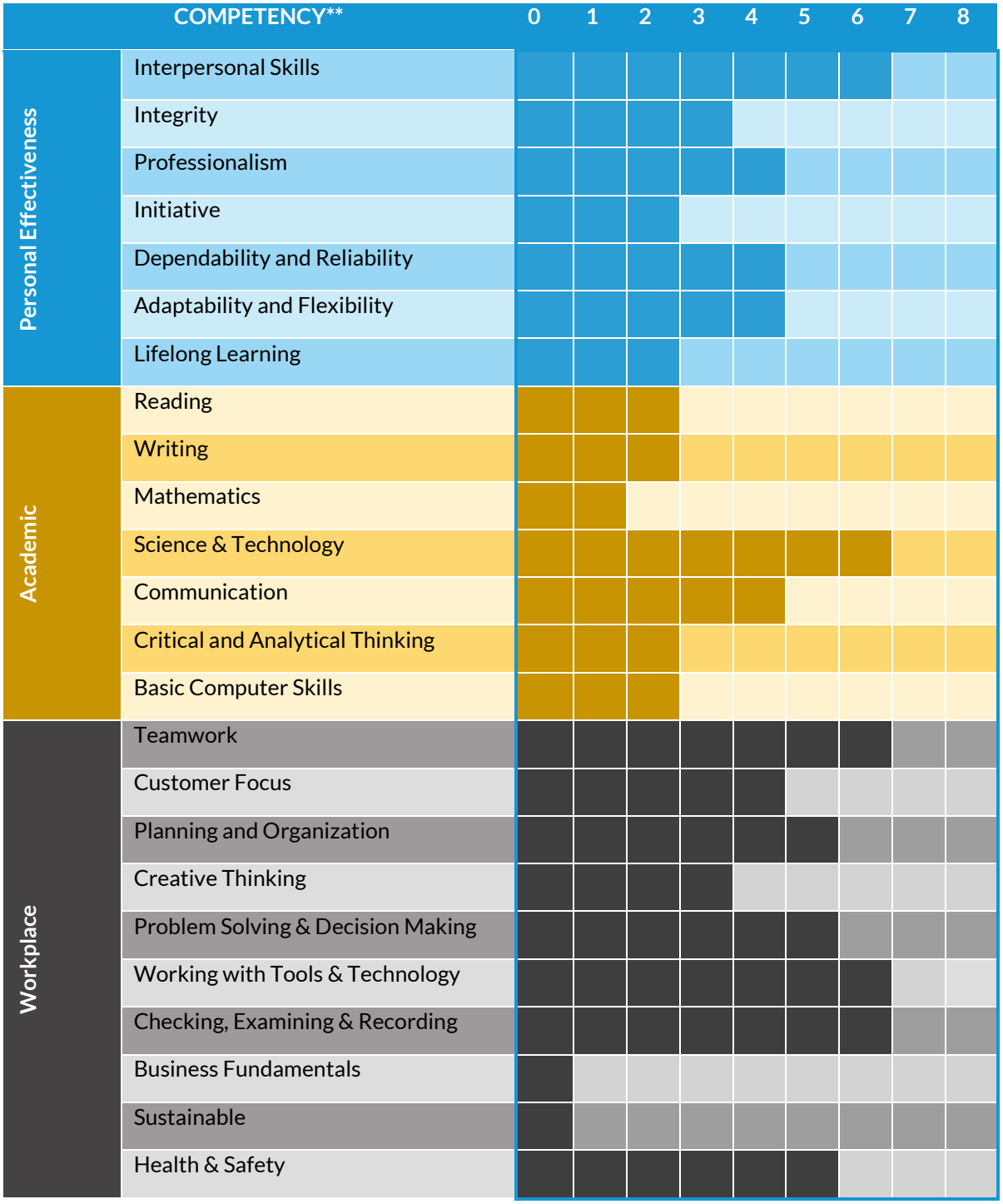
COURSE NAME: SURGICAL TECHNOLOGIST FUNCTIONAL MICROBIOLOGY	Course Number Hours: 15 Total
LEARNING OBJECTIVES	
Surgical Technologist Functional Microbiology introduces general classification, structure and physiology of microorganisms. Students learn the relationship between microorganisms and the human host as well as microbes in the hospital environment. Examines the study of the disease process, transmission of disease and methods of controlling microbial growth.	
COURSE NAME: SURGICAL TECHNOLOGY INTRODUCTION	**Course Number** **Hours: 60 total**
LEARNING OBJECTIVES	
Surgical Technology Introduction provides the foundational knowledge of infection control and asepsis. Legal and ethical issues encountered in the healthcare environment are explored. Simulated laboratory practice enables the learner to develop beginning technical skills	
COURSE NAME: SURGICAL TECHNOLOGY FUNDAMENTALS	**Course Number** **Hours: 90 Total**
LEARNING OBJECTIVES	
Surgical Technology Fundamentals includes the basic clinical skills needed by the Surgical Technologist in the scrub role. Learners develop skills in identifying basic instrumentation, supplies, drains, catheters, dressings and sponges. Includes practice experience in creating a sterile field, draping, passing instruments and supplies, performing counts and preparing supplies. Builds upon and reinforces the role of the Surgical Technologist as a member of the operating room team. Discusses care of the patient before, during and after surgery with emphasis on surgical wounds, wound closure materials, and vital signs.	
COURSE NAME: SURGICAL TECHNOLOGY SURGICAL PROCEDURES	**Course Number** **Hours: 60 Total**
LEARNING OBJECTIVES	
Surgical Technology Surgical Procedures provides the foundational knowledge of surgical core and specialty procedures. Examines the pathophysiology, diagnostic interventions and surgical interventions for a variety of surgical procedures. Incorporates integration of basic health sciences and technical knowledge to complete a plan of action for a surgical procedure.	

COURSE NAME: SURGICAL TECHNOLOGY CLINICAL	Course Number
	Hours: 165 Total

LEARNING OBJECTIVES

In **Surgical Technology Clinical,** students will apply basic surgical theories, principles, and procedural techniques in the operating room. Students begin to function as team members under the guidance of the instructor and authorized clinical personnel. Surgical rotation case requirements are documented. Further experience in a clinical setting allows the student to continue to improve technical skills while accepting more responsibilities during surgical procedures. Enhances the student's technical experience and employee skills. Serves as a transition between student and employee. Application of advanced skills for the entry-level Surgical Technologies in the clinical setting.

Cross Cutting Competencies



**Cross-Cutting Competencies are defined in the Competency Model Clearinghouse:

https://www.careeronestop.org/CompetencyModel/competency-models/buidling-blocks-model.aspx.

Cross-Cutting Competencies identify transferable skills – sometimes called "soft skills" or "employability skills" – that are important for workplace success, regardless of a person's occupation. Still, the relative importance of specific Cross-Cutting Competencies differs from occupation to occupation. The Cross-Cutting Competencies table, above, provides information about which of these competencies is most important to be successful in a particular occupation. This information can be useful to employers or intermediaries in screening and selecting candidates for apprenticeship programs, or to pre-apprenticeship providers that seek to prepare individuals for successful entry into an apprenticeship program.

The names of the Cross-Cutting Competencies come from the U.S. Department of Labor's Competency Model Clearinghouse and definitions for each can be viewed at https://www.careeronestop.org/CompetencyModel/competency-models/building-blocks-model.aspx.

The scoring system utilized to evaluate the level of competency required in each cross cutting skill aligns with the recommendations of the Lumina Foundation's Connecting Credentials Framework. The framework can be found at: http://connectingcredentials.org/wp-content/uploads/2015/05/Connectingtials-4-29-30.pdf.

Detailed Job Functions

JOB FUNCTION 1: Prepare for Surgical Procedures

Related Technical Instruction		
KNOWLEDGE*	**SKILLS***	**TOOLS & TECHNOLOGIES***
Assessing and planning for age-related needs of the patient Biopsychosocial needs of the patient Basic Math/Metric System Conversion Compressed Gases and Regulators Medical terminology Anatomy and Physiology Pharmacology and Anesthesia Pathophysiology Microbiology Electricity Robotics	Aseptic technique Communication skills Mechanical skills Organizational skills (preoperative case management) Obtaining blood from blood bank upon request Donning OR attire Basic Handwash Opening and arranging sterile supplies and instruments Surgical scrub Gowning and gloving self Arranging and cutting sutures and ties Drawing up and labeling medications Gowning and gloving others Draping patient	Air Filtration Systems Anesthesia Machines/Monitors Auto-transfusion units. Blood recovery and delivery systems Catheters/Drains Collection Bags/Devices Coronary Bypass Pumps Crash Carts (Defibrillators) Cryo Units Doppler Ultrasound Units Drapes and Packs Dressings (2X2, 4X4, ABD, AG(?), Bio-adhesive, Non-adhesive, Cast, Eye-Pad, Gauze, Liquid, Packing, Peri-Pad, Tapes) Drugs and Solutions (Antibiotics, Anticoagulants, Antiseptics, Disinfectants, Dyes, Hemostatic Agents, Irrigation Solutions, Local Anesthetics, Radioactive Materials, Steroids, Topical Ointments, Vasodilator/Constrictors) (lights, headlights, spotlights, loupes) ("free", blunt, cutting, taper, trocar) Positioning Equipment (ethylene oxide sterilizers, sterad machines) Electronic/mercury blood pressure units Electrosurgical or electrocautery equipment (argon beam coagulators, electrocautery equipment, spark-gap electrosurgical units, thermal cautery units) Endoscopic video cameras/adapters/accessories/systems Eyemagnets for ophthalmic surgery Flash autoclaves Fracture tables Gloves Gowns Hypo/Hyper-thermia units Implants Insufflators Irrigation pumps

		Laparoscopes, laparoscopic telescopes, lap mayo trays or mayo stands Lasers (Argon, CO2, Holmium, KTP) Light sources Masks Medical cine fluoroscopy equipment Microscopes Needles OR Furniture Ring stands and positioning Equipment Robotic manipulators/surgical navigation systems Smoke Evacuators Sponges (4X4, cottonoid, dental roll, eye sponge, Kitner, Laps, swabs, tonsil sponge) Stretchers Sterilizers Steri-vac aeration cabinets Suction Surgical dermatomes or dermameshers and accessories Surgical Instruments (clamps, cutting, dissectors/elevators, endoscopes, forceps, graspers, needleholders, power equipment, probes/dilators, retractors, suction tips) Surgical nerve stimulators and accessories Surgical pneumatic or battery or electric saws or drills or pin drivers or accessories (craniotome drills, neurotome drills, orthopedic drills, surgical pneumatic drills) Pneumatic tourniquets Surgical power equipment sets or accessories (robotic arms, surgical robotics equipment, voice activated surgical systems) Surgical scalpels, knives, blades, trephines, or accessories Sutures (absorbable, non-absorbable, staples, steri-strips) Therapeutic healing or cooling blankets or drapes Tourniquets Trach Tube Ultrasound Video/cameras, recorders, printers Vascular sequential compression devices or tubing (venodynes) Vein harvest kits or systems (endoscopic vein harvesting equipment) X-ray fluoroscopy

* Detailed descriptions are available online from the Association for Surgical Technologists (2011) and the National Center for Competency Testing (2017).

	Core or Optional
Competency A: Prepare the operating room environment according to the surgical procedure	
PERFORMANCE CRITERIA	
1. Identify supplies and equipment needed for the procedure	Core
2. Identify furniture needed in the room	Core
3. Assemble supplies and equipment in the room	Core
4. Verify the presence of surgical team members and patient	Core
5. Anticipate the needs of special patient populations	Core
Competency B: Prepare for the specific procedure	
PERFORMANCE CRITERIA	
1. Gather specific surgical supplies, medications, and equipment based on the surgeon's preference card	Core
2. Check package integrity and expiration date of sterile supplies	Core
3. Obtain specialized patient equipment	Core
4. Perform urinary catheterization	Core
5. Perform skin preparation	Core
6. Assemble and test positioning equipment	Core
7. Don personal protective equipment	Core
Competency C: Establish sterile field	
PERFORMANCE CRITERIA	
1. Follow principles of sterile technique while opening supplies for the surgery	Core
2. Perform surgical hand scrub	Core
3. Don sterile gown and gloves	Core
4. Set up and inspect sterile instruments and supplies for surgical procedures	Core
Competency D: Take preoperative precautions	
PERFORMANCE CRITERIA	
1. Perform preoperative count with the circulating nurse	Core
2. Verify identity of the patient and operative site	Core

3. Verify and label medications and solutions at the sterile field	Core
Competency E: Prepare the patient and surgical team	
PERFORMANCE CRITERIA	
1. Transfer patient to the operating room table	Core
2. Place safety belt and pressure pads on the patient	Core
3. Assist surgical team with gloving and gowning	Core
4. Assist with draping the patient	Core
Competency F: Participate in surgical time out	
PERFORMANCE CRITERIA	
1. Confirm names and roles of all team members	Core
2. Confirm patient identity, surgical site, and procedure	Core
3. Participate in review of anticipated critical events	Core
4. Confirm equipment availability and sterility	Core

JOB FUNCTION 2: Perform Intraoperative Duties/Activities

Related Technical Instruction		
KNOWLEDGE*	**SKILLS***	**TOOLS & TECHNOLOGIES***
Assessing and planning for age-related needs of the patient Basic Math/Metric System Conversion Compressed Gases and Regulators Medical terminology Anatomy and Physiology Pharmacology and Anesthesia Pathophysiology Microbiology Electricity Robotics Tissue replacement materials	Aseptic technique Communication skills Mechanical skills Specimen care Incisions Use of catheters and drains Wound closure Surgical dressings Loading and passing needles Tagging and cutting sutures Passing ties Re-gloving and re-gowning	Air Filtration Systems Anesthesia Machines/Monitors Auto-transfusion units. Blood recovery and delivery systems Catheters/Drains Collection Bags/Devices Coronary Bypass Pumps Crash Carts (Defibrillators) Cryo Units Doppler Ultrasound Units Drapes and Packs Dressings Drugs and Solutions (Antibiotics, Anticoagulants, Antiseptics, Disinfectants, Dyes, Hemostatic Agents, Irrigation Solutions, Local Anesthetics, Radioactive Materials, Steroids, Topical Ointments, Vasodilator/Constrictors) Electronic/mercury blood pressure units Electrosurgical or electrocautery equipment Endoscopic video cameras/adapters/accessories/systems Eyemagnets for ophthalmic surgery Flash autoclaves Fracture tables Gloves Gowns Hypo/Hyper-thermia units Implants Insufflators Irrigation pumps Laparoscopes, laparoscopic telescopes, lap mayo trays or mayo stands Lasers Light sources Masks Medical cine fluoroscopy equipment Microscopes Needles OR Furniture Ring stands and positioning Equipment Robotic manipulators/surgical navigation systems Smoke Evacuators Sponges

		Stretchers Sterilizers Steri-vac aeration cabinets Suction Surgical dermatomes or dermameshers and accessories Surgical Instruments (clamps, cutting, dissectors/elevators, endoscopes, forceps, graspers, needleholders, power equipment, probes/dilators, retractors, suction tips) Surgical nerve stimulators and accessories Surgical pneumatic or battery or electric saws or drills or pin drivers or accessories (craniotome drills, neurotome drills, orthopedic drills, surgical pneumatic drills) Pneumatic tourniquets Surgical power equipment sets or accessories (robotic arms, surgical robotics equipment, voice activated surgical systems) Surgical scalpels, knives, blades, trephines, or accessories Sutures Therapeutic healing or cooling blankets or drapes Tourniquets Trach Tube Ultrasound Video/cameras, recorders, printers Vascular sequential compression devices or tubing (venodynes) Vein harvest kits or systems (endoscopic vein harvesting equipment) X-ray fluoroscopy

* Detailed descriptions are available online from the Association for Surgical Technologists (2011) and the National Center for Competency Testing (2017).

	Core or Optional
Competency A: Maintain the operating room environment according to surgical procedure	
PERFORMANCE CRITERIA	
1. Ensure aseptic technique is maintained by all OR team members throughout the surgical procedure	Core
2. Maintain suction	Core

3. Maintain temperature	Core
4. Maintain lighting	Core
5. Maintain furniture	Core
Competency B: Provide the surgical team members with supplies required for the procedure	
PERFORMANCE CRITERIA	
1. Obtain the appropriate sutures/needles/stapling devices	Core
2. Prepare and cut suture materials as directed	Core
3. Prepare drains, catheters, and tubing for use at the end of the case	Core
Competency C: Assemble and test materials and specialty equipment during surgery	
PERFORMANCE CRITERIA	
1. Assemble internal stapling devices	Core
2. Verify with the surgeon and the circulating nurse the specific type and/or size of implantable devices	Core
3. Connect and activate drains to the suctioning device	Core
4. Assemble and apply dressing material before transporting the patient to the recovery room	Core
Competency D: Anticipate needs during surgery	
PERFORMANCE CRITERIA	
1. Anticipate the need for retraction to facilitate proper operative exposure	Core
2. Pass instruments and supplies as anticipated during surgery	Core
3. Anticipate the need for and implement suctioning, sponging, and irrigation	Core
4. Anticipate the need for various hemostatic agents based on the type of surgery	Core
Competency E: Provide intraoperative assistance when delegated by a surgeon	
PERFORMANCE CRITERIA	
1. Cauterize when directed by a surgeon	Core
2. Assist in the placement of wound drains	Core
3. Assist with skin closure	Core
4. Assist with the application of casts, splints, braces, and similar devices	Core

Competency F: Handle medications, solutions, and specimens appropriately	
PERFORMANCE CRITERIA	
1. Verify and label medications and solutions at the sterile field intraoperatively	Core
2. Report the total amount of medications and solutions used during the procedure	Core
3. Handle specimens appropriately	Core
Competency G: Perform closing sponge, needle, and instrument counts	
PERFORMANCE CRITERIA	
1. Count and record sponges, needles, and instruments prior to procedure	Core
2. Count closing sponges, needles, and instruments	Core
3. Immediately report any discrepancies	Core

JOB FUNCTION 3: Perform Postoperative Procedures and Room Turnover

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
Hazardous materials, including sharps, blood borne pathogen safety, and radiological safety Unit procedure for placing used instruments in case cart Standard precautions and procedures	Organizational skills Sterile Technique Assure implants used in the case are communicated to the circulating nurse Applying dressings Connecting drains Connecting ostomy bags	Sterilization equipment Dressings Drains Ostomy bags

	Core or Optional
Competency A: Conduct postoperative patient care	
PERFORMANCE CRITERIA	
1. Remove surgical drapes from the patient	Core
2. Cleanse the patient's skin	Core
3. Apply dressings, connect drains, and connect ostomy bag as needed	Core
4. Assist with patient transfer from the operating table to the stretcher	Core
5. Observe the patient postoperatively for any bleeding and relay status to the surgical team	Core
6. Maintain the sterility of the back table and mayo stand until the patient leaves the room	Core
Competency B: Dispose of waste	
PERFORMANCE CRITERIA	
1. Reduce bioburden from instruments	Core
2. Comply with standard precautions when removing and discarding drapes and waste	Core
3. Dispose all sharps in compliance with standard precautions and procedures	Core

Competency C: Perform room turnover after surgery	
PERFORMANCE CRITERIA	
1. Disassemble the instruments for the decontamination and sterilization process	Core
2. Return unused supplies and equipment to the designated location	Core
3. Disinfect furniture and equipment	Core
4. Remove/transport equipment	Core
5. Dispose of waste	Core
6. Wet vacuum/mop floor	Core
7. Dress the bed	Core
8. Inspect for room readiness	Core

JOB FUNCTION 4: Assist Circulator

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
Age-related needs of the patient Basic Pharmacology Biopsychosocial needs of the patient Body mechanics Chart review Cultural Awareness Death and Dying Discharge Planning Health and Wellness Infection control Microbiology Patient identification Patient Rights Patient safety Documentation procedures	Post-operative care management Post-anesthesia care Patient catheterization Patient skin prep CPR Communication Skills Interpersonal Skills Problem Solving Skills Taking vital signs Identifying and managing complications Repositioning patient Transporting patient Transferring patient	Beepers Wheelchairs

	Core or Optional
Competency A: Assist with/provide patient care	
PERFORMANCE CRITERIA	
1. Assist with surgical preparation	Core
2. Assist with placement of monitoring equipment	Core
3. Assist with positioning of patient	Core
4. Assist with/provide post procedure care	Core
5. Assist with casting	Core
6. Assist with patient transport	Core
7. Assist with patient transfer	Core
Competency B: Assist with supplies and equipment	
PERFORMANCE CRITERIA	
1. Procure additional supplies as needed	Core
2. Transport specimens	Core
3. Pretest equipment for use as directed	Core

JOB FUNCTION 5: Recognize and Demonstrate Knowledge of the Maintenance of Surgical Supplies/Equipment

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
Pathophysiology Microbiology Hazardous materials protocols Blood borne pathogen safety Radiological safety State and Federal Regulations/OSHA	Sterilization procedures	Various sterilizers Flash autoclaves Steri-vac aeration cabinets

	Core or Optional
Competency A: Wash and decontaminate instruments	
PERFORMANCE CRITERIA	
1. Washes instruments	Core
2. Decontaminates instruments	Core
Competency B: Ultrasound, milk, rinse, and dry instruments	
PERFORMANCE CRITERIA	
1. Ultrasound instruments	Core
2. Employs a milk bath for surgical instruments	Core
3. Rinses surgical instruments	Core
4. Dries surgical instruments	Core
Competency C: Assemble Instrument Trays	
PERFORMANCE CRITERIA	
1. Identify and locate instruments	Core
2. Organize instruments in appropriate trays in appropriate organization	Core

Competency D: Prepare for and operate sterilizers	
PERFORMANCE CRITERIA	
1. Prepare for and operate a peracidity acid sterilizer	Core
2. Prepare for and operate an ETO sterilizer	Core
3. Prepare for and operate a steam sterilizer	Core
4. Prepare for and operate a hydrogen peroxide plasma sterilizer	Core
5. Prepare for and operate a dry heat sterilizer	Core
6. Prepare for and operate a glutaraldehyde disinfection sterilization processor	Core

JOB FUNCTION 6: Provide safe environment

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
Preoperative safety concerns Intraoperative safety concerns Postoperative safety concerns Electrical Safety Fire Safety Patient safety Hazardous materials protocols Handling of sharps Blood borne pathogen safety Radiological safety State and Federal Regulations/OSHA	Communication skills	Anaesthesia machine Pulse oximeter Imaging machine Hazardous materials disposal unit Sharps disposal unit

	Core or Optional
Competency A: Maintain a safe preoperative environment	
PERFORMANCE CRITERIA	
1. Initiate preventative and/or corrective actions in potentially hazardous preoperative situations	Core
2. Perform appropriate actions during a preoperative emergency	Core
Competency B: Maintain a safe intraoperative environment	
PERFORMANCE CRITERIA	
1. Initiate preventative and/or corrective actions in potentially hazardous intraoperative situations	Core
2. Perform appropriate actions during a intraoperative emergency	Core
Competency C: Maintain a safe postoperative environment	
PERFORMANCE CRITERIA	
1. Initiate preventative and/or corrective actions in potentially hazardous postoperative situations	Core
2. Perform appropriate actions during a postoperative emergency	Core

Competency D: Practice precautions with critical equipment	
PERFORMANCE CRITERIA	
1. Practice laser precautions	Core
2. Practice electrical safety	Core
3. Practice radiation safety	Core
4. Handle compressed gas tanks and connections safely	Core
Competency E: Practice general safety precautions	
PERFORMANCE CRITERIA	
1. Practice/Adhere to universal precautions	Core
2. Report/document unusual happenings	Core
3. Remove defective equipment from service and report	Core
4. Maintain room organization	Core

JOB FUNCTION 7: Perform Departmental Responsibilities

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
Departmental Policies and Procedures Patient Rights	Computer skills (with database software, email software, graphics software, internet browsers, medical software [Electronic Medical Record EMR, PracticeWorks Systems Kodak WINOMS CS, Supply documentation software, surgery workflow communication software], Microsoft Office Suite.) Communication skills Interpersonal skills Teaching skills	Computers Database software Medical software

	Core or Optional
Competency A: Receive/participate in department communications	
PERFORMANCE CRITERIA	
1. Receive department communications	Core
2. Participate in departmental communications	Core
Competency B: Inventory supplies	
PERFORMANCE CRITERIA	
1. Identify locations for all supplies	Core
2. Count and record supplies	Core

Competency C: Rotate supplies	
PERFORMANCE CRITERIA	
1. Identify supplies' levels of use	Core
2. Rotate supplies to equalize levels of use	Core
Competency D: Order supplies	
PERFORMANCE CRITERIA	
1. Identify supplies in need of replacement	Core
2. Order needed supplies or submit appropriate order request	Core
Competency E: Use/update surgeon preference cards	
PERFORMANCE CRITERIA	
1. Locate preference card for appropriate surgeon and procedure	Core
2. Know how to identify, locate, and use all items on preference card	Core
3. Identify potential inaccuracies	Core
4. Identify potentially out of date equipment, new processes, or changed surgeon preferences	Core
5. Report concerns so that preference card is appropriately updated	Core
Competency F: Attend inter-/intra-departmental committees	
PERFORMANCE CRITERIA	
1. Participate as a member in inter-/intra- departmental committees as appropriate	Core
2. Record committee meeting schedules and duties	Core
3. Attend scheduled committee meetings	Core
Competency G: Maintain cleanliness of department	
PERFORMANCE CRITERIA	
1. Identify and remedy problems with cleanliness of department	Core
2. Monitor environmental features of operating theaters (such as positive pressure, air-conditioning systems and filters)	Core

JOB FUNCTION 8: Maintain Professional Responsibility

Related Technical Instruction		
KNOWLEDGE	**SKILLS**	**TOOLS & TECHNOLOGIES**
Professional behavior	Stress management skills	Online resources for maintaining professional competencies and certification

	Core or Optional
Competency A: Maintain institutional competencies	
PERFORMANCE CRITERIA	
1. Know required institutional competencies	Core
2. Maintain competencies	Core
3. Attain new competencies as required by institutional or professional changes	Core
Competency B: Practice cost containment	
PERFORMANCE CRITERIA	
1. Identify activities critical to cost containment	Optional
2. Maintain practices that limit costs without sacrificing safety or level of outcomes	Optional
Competency C: Attend/contribute to in-service classes	
PERFORMANCE CRITERIA	
1. Identify and record content and schedule of in-service classes	Core
2. Attend relevant in-service classes	Core
3. Contribute to in-service classes as appropriate	Core
Competency D: Evaluate new equipment	
PERFORMANCE CRITERIA	
1. Identify newly obtained equipment	Optional
2. Confirm proper functioning of newly obtained equipment	Optional

Competency E: Precept new employees/students	
PERFORMANCE CRITERIA	
1. Maintain supportive relationships with new surgical tech employees/students	Core
2. Precept new surgical tech employees/students	Core
3. Monitor and assess knowledge acquisition of new surgical tech employees/students	Core
Competency F: Participate in performance improvement activities	
PERFORMANCE CRITERIA	
1. Contribute to development of performance improvement plans for partially achieved competencies	Core
2. Engage in training or experiential activities as specified by performance improvement plans	Core

References

Association of Surgical Technologists, 2011. "Core Curriculum for Surgical Technology, 6th Edition." on the Internet at http://www.ast.org/ *(visited July 2018*).

The National Board of Surgical Technology and Surgical Assisting, on the Internet at http://www.nbstsa.org/ *(visited September 2017).*

National Center for Competency Testing. 2017. "Tech in Surgery – Certified TS-C (NCCT) Detailed Test Plan. "On the Internet at https://www.ncctinc.com/ *(visited July 2018).*

Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Surgical Technologists on the Internet at https://www.bls.gov/ooh/healthcare/surgical-technologists.htm (*visited September 2017*).

For a list of accredited programs for surgical technologists, visit the website for the Commission on Accreditation of Allied Health Education Programs, on the Internet at https://www.caahep.org/ (*visited September 2017*).

Statement of Independence

The Urban Institute strives to meet the highest standards of integrity and quality in its research and analyses and in the evidence-based policy recommendations offered by its researchers and experts. We believe that operating consistent with the values of independence, rigor, and transparency is essential to maintaining those standards. As an organization, the Urban Institute does not take positions on issues, but it does empower and support its experts in sharing their own evidence-based views and policy recommendations that have been shaped by scholarship. Funders do not determine our research findings or the insights and recommendations of our experts. Urban scholars and experts are expected to be objective and follow the evidence wherever it may lead.

2100 M Street NW
Washington, DC 20037

www.urban.org