Biomedical Equipment Technician Skill Standards

TEXAS WORKFORCE INVESTMENT COUNCIL

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Critical Work Function	Key Activity	Key Activity	Key Activity	Key Activity	Key Activity
1. Install Biomedical Equipment	1.1 Receive, inspect and inventory equipment upon delivery	1.2 Deliver equipment to installation location	1.3 Conduct incoming inspection	1.4 Install equipment	
2. Maintain Installed Biomedical Equipment	2.1 Conduct scheduled preventive maintenance	2.2 Order parts and supplies	2.3 Respond to device alerts and recalls	2.4 Conduct rounds	
3. Repair Installed Biomedical Equipment	3.1 Respond to device failures reported by users	3.2 Diagnose equipment malfunctions	3.3 Order parts and supplies	3.4 Repair faults and calibrate equipment	3.5 Return equipment to service
4. Follow Safety Procedures	4.1 Respond to emergencies	4.2 Ensure public and employee safety in the healthcare facility	4.3 Identify hazards in and around work areas		
5. Manage Documentation	5.1 Maintain equipment, parts, and inventory database	5.2 Assist with equipment recalls and health device alerts (HDAs)	5.3 Update equipment maintenance documentation		
6. Schedule and Oversee Third Party Repair	6.1 Coordinate resources to facilitate repairs	6.2 Conduct quality assurance check of third-party repairs	6.3 Verify third party documentation of repairs		
7. Provide Technical Assistance and Instruction on Equipment Operation and Maintenance	7.1 Demonstrate equipment for facility staff	7.2 Respond to user requests for assistance	7.3 Identify need for in-service presentations		

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 1. Install Biomedical Equipment		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
1.1 Receive, inspect and inventory equipment upon delivery	1.1.1 Incoming inspection form properly completed 1.1.2 Incoming inspection form data accurately entered into CMMS (Computerized Maintenance Management System) 1.1.3 Inspection sticker and asset/control number affixed to equipment	Function and operation of monitoring systems Function and operation of portable equipment Function and operation of life support equipment Function and operation of therapeutic equipment Function and operation of laboratory equipment Function and operation of diagnostic imaging equipment Function and operation of electrical safety test equipment Function and operation of defibrillator test equipment Function and operation of electro-surgical test equipment Function and operation of physiologic simulators Function and operation of diagnostic equipment Medical Device Data Systems (MDDS) Knowledge of electrical safety standards such as NFPA 99 Proper lifting techniques	Hand tools Electrical safety analyzer Computerized Maintenance Management System (CMMS)
1.2 Deliver equipment to installation location	1.2.1 Work order completion indicates proper delivery 1.2.2 Visual inspection by supervisor and director	Standard biological precautions Public Address alerts and codes	Hand tools

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 1. Install Biomedical Equipment		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
1.3 Conduct incoming inspection	1.3.1 Incoming inspection form properly completed 1.3.2 Work order completed in CMMS 1.3.3 Completed incoming inspection form attached to work order	Function and operation of monitoring systems Function and operation of portable equipment Function and operation of life support equipment Function and operation of therapeutic equipment Function and operation of laboratory equipment Function and operation of diagnostic imaging equipment Function and operation of electrical safety test equipment Function and operation of defibrillator test equipment Function and operation of electro-surgical test equipment Function and operation of physiologic simulators Function and operation of diagnostic equipment Medical Device Data Systems (MDDS) Fundamentals of electricity and electronics Knowledge of electrical safety standards such as NFPA 99 Knowledge of ANSI standards	Defibrillator analyzer Hand tools Non-invasive blood pressure (NIBP) analyzer Tachometer Spectrum analyzer Electrical safety analyzer Electrical surgical unit (ESU) analyzer Patient simulators (e.g. SpO_2 simulator) Frequency scanner Fetal monitor simulator Phantoms O_2 meter Watt meter Cabling, terminals Test lungs IV testers Pressure meters Diagnostic software Test equipment Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 1. Install Biomedical Equipment		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
1.4 Install equipment	1.4.1 Equipment is configured and performs to users' requirements 1.4.2 Installation work order indicates electrical safety test passed and meets NFPA 99 standards 1.4.3 Work order indicates performance verification (functional) test passed successfully 1.4.4 Installation is documented in CMMS with all relevant checklists complete	Function and operation of monitoring systems Function and operation of portable equipment Function and operation of life support equipment Function and operation of therapeutic equipment Function and operation of diagnostic imaging equipment Function and operation of electrical safety test equipment Function and operation of defibrillator test equipment Function and operation of electro-surgical test equipment Function and operation of physiologic simulators Function and operation of diagnostic equipment Medical Device Data Systems (MDDS) Network protocols Medical device integration Fundamentals of electricity and electronics Standard biological precautions Knowledge of OSHA standards Knowledge of electrical safety standards such as NFPA 99 Knowledge of ANSI standards Knowledge of TJC (JCAHO) standards Proper lifting techniques	Hand tools Electrical safety analyzer Cabling, terminals Diagnostic software Test equipment

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Academic and Employability Knowledge and Skill Matrix for Critical Work Function 1: Install Biomedical Equipment

On a scale of 1 (lowest) to 5 (highest), identify the level of complexity required in each of these skills for the worker to perform the critical work function. Keep in mind that this scale is not for rating an individual's proficiency. It is intended only for rating the level of complexity required to do the work.

Occupational Title: Biomedical Equipment Technician																
CWF 1																
Listening	Speaking	Using Information and Communication Technology	Gathering and analyzing Information	Analyzing and Solving Problems	Making Decisions and Judgments	Organizing and Planning	Using Social Skills	Adaptability	Working in Teams	Leading Others	Building Consensus	Self and Career Development	Writing	Reading	Mathematics	Science
3	3	3	2	3	3	2	3	3	3	3	2	3	2	3	2	2

Statement of Assessment for Critical Work Function 1:

The statements of assessment can do any of several things:

- *Define tools or strategies that industry could use to assess the level of competency a worker has attained in a particular critical work function.*
- *Define for trainers and educators how to assess the level of competency a student has attained relevant to the critical work function.*
- *Define the level of mastery of the critical work function that indicates that a worker or student has achieved an entry-, intermediate-, or advanced level of mastery of a critical work function.*

A. Tests could include:

1) Multiple choice and essay questions that demonstrate an understanding of knowledge being assessed.
2) Preparation and justification of a reasonable solution to a problem scenario.

B. Hands-on exercises or simulations to demonstrate acquisition of knowledge and skills that could:

1) Apply relevant knowledge or skills
2) Focus on the application of knowledge and skills to a new situation
3) Demonstrate an ability to plan, organize, and create a product, service, or an event.
4) Illustrate by individual performance the attained levels of knowledge and skills.
5) Include observation of events, groups, and individuals that focuses on the relevant traits of the skill in question

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 2. Maintain Installed Biomedical Equipment		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
2.1 Conduct scheduled preventive maintenance	2.1.1 Preventive maintenance (PM) work order indicates electrical safety test passed successfully 2.1.2 PM work order indicates performance verification (functional) test passed successfully 2.1.3 Documentation attached to closed PM work order indicates equipment operating within range of manufacturer specifications 2.1.4 PM task is complete within specified departmental time period 2.1.5 PM sticker is current and affixed to equipment	Function and operation of monitoring systems Function and operation of portable equipment Function and operation of life support equipment Function and operation of therapeutic equipment Function and operation of laboratory equipment Function and operation of diagnostic imaging equipment Function and operation of electrical safety test equipment Function and operation of defibrillator test equipment Function and operation of electro-surgical test equipment Function and operation of physiologic simulators Function and operation of oscilloscopes Function and operation of diagnostic equipment Medical Device Data Systems (MDDS) Medical device integration Fundamentals of electricity and electronics Familiarity with medical terminology Standard biological precautions Knowledge of OSHA standards Knowledge of electrical safety standards such as NFPA 99 Knowledge of ANSI standards Knowledge of TJC (JCAHO) standards Proper lifting techniques	Oscilloscope Defibrillator analyzer Hand tools Non-invasive blood pressure (NIBP) analyzer Tachometer Spectrum analyzer Electrical safety analyzer Electrical surgical unit (ESU) analyzer Patient simulators (e.g. SpO_2 simulator) Frequency scanner Fetal monitor simulator Phantoms Electronic components O_2 meter Watt meter Chemical cleaning supplies Personal protective equipment (PPE) Cabling, terminals Test lungs IV testers IV tubing Pressure meters Anti-static mat Diagnostic software Personal protective equipment Audio meter Test equipment Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 2. Maintain Installed Biomedical Equipment		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
2.2 Order parts and supplies	2.2.1 Correct identification of replacement part on order documentation 2.2.2 Parts ordered from approved vendor/manufacturer 2.2.3 Parts accurately documented in CMMS 2.2.4 Parts ordered with respect to priority of repair	Medical Device Data Systems (MDDS) Fundamentals of electricity and electronics Familiarity with medical terminology	Computerized Maintenance Management System (CMMS)
2.3 Respond to device alerts and recalls initiated by various entities	2.3.1 Sufficient supply replacements ordered to complete device recall 2.3.2 Defective or recalled part(s) returned as required according to recall instructions 2.3.3 Return documentation completed with all require data including serial numbers, model numbers, etc., according to recall instructions	Medical Device Data Systems (MDDS) Network protocols Fundamentals of electricity and electronics Familiarity with medical terminology Standard biological precautions Knowledge of electrical safety standards such as NFPA 99 Awareness of Emergency Care Research Institute (ECRI) notifications	Test equipment Computerized Maintenance Management System (CMMS)
2.4 Conduct rounds	2.4.1 Assigned department is visited as required by supervisor preference 2.4.2 Work Order reflects completion of rounds 2.4.3 Favorable technician feedback received during supervisor rounds (zone inspection rounds)	Medical Device Data Systems (MDDS) Health Information Portability and Accountability Act (HIPAA) Network protocols Familiarity with medical terminology Standard biological precautions Knowledge of OSHA standards Knowledge of electrical safety standards such as NFPA 99 Knowledge of ANSI standards Knowledge of TJC (JCAHO) standards	Hand tools Personal protective equipment Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Academic and Employability Knowledge and Skill Matrix for Critical Work Function 2: Maintain Installed Biomedical Equipment

On a scale of 1 (lowest) to 5 (highest), identify the level of complexity required in each of these skills for the worker to perform the critical work function. Keep in mind that this scale is not for rating an individual's proficiency. It is intended only for rating the level of complexity required to do the work.

Occupational Title: Biomedical Equipment Technician																
CWF 2																
Listening	Speaking	Using Information and Communication Technology	Gathering and analyzing Information	Analyzing and Solving Problems	Making Decisions and Judgments	Organizing and Planning	Using Social Skills	Adaptability	Working in Teams	Leading Others	Building Consensus	Self and Career Development	Writing	Reading	Mathematics	Science
2	2	2	3	3	3	3	3	3	3	2	3	3	2	3	2	2

Statement of Assessment for Critical Work Function 2:

The statements of assessment can do any of several things:

- *Define tools or strategies that industry could use to assess the level of competency a worker has attained in a particular critical work function.*
- *Define for trainers and educators how to assess the level of competency a student has attained relevant to the critical work function.*
- *Define the level of mastery of the critical work function that indicates that a worker or student has achieved an entry-, intermediate-, or advanced level of mastery of a critical work function.*

A. Tests could include:

1) Multiple choice and essay questions that demonstrate an understanding of knowledge being assessed.
2) Preparation and justification of a reasonable solution to a problem scenario.

B. Hands-on exercises or simulations to demonstrate acquisition of knowledge and skills that could:

1) Apply relevant knowledge or skills
2) Focus on the application of knowledge and skills to a new situation
3) Demonstrate an ability to plan, organize, and create a product, service, or an event.
4) Illustrate by individual performance the attained levels of knowledge and skills
5) Include observation of events, groups, and individuals that focuses on the relevant traits of the skill in question

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 3. Diagnose Equipment Malfunctions		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
3.1 Respond to device failures reported by users	3.1.1 Notification from dispatcher is acknowledged within required departmental time frames 3.1.2 Technician responds to work order according to the assigned priority 3.1.3 Technician closes with call initiator to determine the malfunction symptom 3.1.4 Call initiators indicate favorable technician responses for example, from customer satisfaction surveys	Function and operation of monitoring systems Function and operation of portable equipment Function and operation of life support equipment Function and operation of therapeutic equipment Function and operation of laboratory equipment Function and operation of diagnostic imaging equipment Function and operation of electrical safety test equipment Function and operation of defibrillator test equipment Function and operation of electro-surgical test equipment Function and operation of physiologic simulators Function and operation of diagnostic equipment Medical Device Data Systems (MDDS) Network protocols Medical device integration Fundamentals of electricity and electronics Familiarity with medical terminology Standard biological precautions Proper lifting techniques	Hand tools Electrical safety analyzer Personal protective equipment (PPE) Test equipment Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 3. Diagnose Equipment Malfunctions		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
3.2 Diagnose equipment malfunctions	3.2.1 Technician references appropriate manufacturer service literature 3.2.2 Technician exercises efficient use of available, reliable resources, i.e., senior technicians, manufacturer technical support, etc. 3.2.3 Technician uses appropriate diagnostic tools to determine the problem	Function and operation of monitoring systems Function and operation of portable equipment Function and operation of life support equipment Function and operation of therapeutic equipment Function and operation of laboratory equipment Function and operation of diagnostic imaging equipment Function and operation of electrical safety test equipment Function and operation of defibrillator test equipment Function and operation of electro-surgical test equipment Function and operation of physiologic simulators Function and operation of oscilloscopes Function and operation of diagnostic equipment Medical Device Data Systems (MDDS) Medical device integration Fundamentals of electricity and electronics Familiarity with medical terminology Standard biological precautions Knowledge of OSHA standards Knowledge of electrical safety standards such as NFPA 99 Knowledge of ANSI standards Knowledge of TJC (JCAHO) standards	Oscilloscope Defibrillator analyzer Hand tools Non-invasive blood pressure (NIBP) analyzer Tachometer Spectrum analyzer Electrical safety analyzer Electrical surgical unit (ESU) analyzer Patient simulators (e.g. SpO_2 simulator) Frequency scanner Fetal monitor simulator Phantoms Electronic components O_2 meter Watt meter Personal protective equipment (PPE) Cabling, terminals Test lungs IV testers IV tubing Pressure meters Anti-static mat Diagnostic software Personal protective equipment Test equipment Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 3. Diagnose Equipment Malfunctions		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
3.3 Order parts and supplies	3.3.1 Correct identification of replacement part 3.3.2 Parts ordered from approved vendor/manufacturer 3.3.3 Parts accurately documented in CMMS 3.3.4 Parts ordered with respect to priority of repair	Medical Device Data Systems (MDDS)	Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 3. Diagnose Equipment Malfunctions		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
3.4 Repair faults and calibrate equipment	3.4.1 Technician follows procedures from the appropriate manufacturer service manual 3.4.2 Technician uses appropriate tools to facilitate repair 3.4.3 Performance verification and/or calibration complete to manufacturer specification	Function and operation of monitoring systems Function and operation of portable equipment Function and operation of life support equipment Function and operation of therapeutic equipment Function and operation of laboratory equipment Function and operation of diagnostic imaging equipment Function and operation of electrical safety test equipment Function and operation of defibrillator test equipment Function and operation of electro-surgical test equipment Function and operation of physiologic simulators Function and operation of oscilloscopes Function and operation of diagnostic equipment Medical Device Data Systems (MDDS) Medical device integration Fundamentals of electricity and electronics Familiarity with medical terminology Standard biological precautions Knowledge of electrical safety standards such as NFPA 99 Knowledge of ANSI standards Knowledge of TJC (JCAHO) standards Proper lifting techniques	Oscilloscope Defibrillator analyzer Hand tools Non-invasive blood pressure (NIBP) analyzer Tachometer Spectrum analyzer Electrical safety analyzer Electrical surgical unit (ESU) analyzer Patient simulators (e.g. SpO_2 simulator) Frequency scanner Fetal monitor simulator Phantoms Electronic components O_2 meter Watt meter Chemical cleaning supplies Personal protective equipment (PPE) Cabling, terminals Test lungs IV testers IV tubing Pressure meters Anti-static mat Diagnostic software Personal protective equipment Audio meter Test equipment Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 3. Diagnose Equipment Malfunctions		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
3.5 Return equipment to service	3.5.1 Final operational check performed per manufacturer specification 3.5.2 Electrical safety test complete per NFPA 99 and/or facility requirements 3.5.3 Equipment returned to unit or facility 3.5.4 Technician closes with call initiator and/or appropriate leadership 3.5.5 Work Order closed out to include original complaint, technician diagnosis, actual repair of the equipment, and supporting documentation	Medical Device Data Systems (MDDS) Network protocols Medical device integration Familiarity with medical terminology Standard biological precautions Knowledge of electrical safety standards such as NFPA 99 Knowledge of TJC (JCAHO) standards Proper lifting techniques	Hand tools Personal protective equipment (PPE) Computerized Maintenance Management System (CMMS)
3.6 Conduct rounds	3.6.1 Assigned department is visited as required by supervisor preference 3.6.2 Work Order reflects completion of rounds 3.6.3 Favorable technician feedback received during supervisor rounds (zone inspection rounds)	Health Information Portability and Accountability Act (HIPAA) Familiarity with medical terminology Standard biological precautions Knowledge of OSHA standards Public Address alerts and codes Awareness of Emergency Care Research Institute (ECRI) notifications	Hand tools Personal protective equipment Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Academic and Employability Knowledge and Skill Matrix for Critical Work Function 3: Repair Installed Biomedical Equipment

On a scale of 1 (lowest) to 5 (highest), identify the level of complexity required in each of these skills for the worker to perform the critical work function. Keep in mind that this scale is not for rating an individual's proficiency. It is intended only for rating the level of complexity required to do the work.

Occupational Title: Biomedical Equipment Technician																
CWF 3																
Listening	Speaking	Using Information and Communication Technology	Gathering and analyzing Information	Analyzing and Solving Problems	Making Decisions and Judgments	Organizing and Planning	Using Social Skills	Adaptability	Working in Teams	Leading Others	Building Consensus	Self and Career Development	Writing	Reading	Mathematics	Science
2	3	3	3	3	3	3	3	3	3	2	3	3	2	3	2	2

Statement of Assessment for Critical Work Function 3:

The statements of assessment can do any of several things:

- *Define tools or strategies that industry could use to assess the level of competency a worker has attained in a particular critical work function.*
- *Define for trainers and educators how to assess the level of competency a student has attained relevant to the critical work function.*
- *Define the level of mastery of the critical work function that indicates that a worker or student has achieved an entry-, intermediate-, or advanced level of mastery of a critical work function.*

A. Tests could include:

1) Multiple choice and essay questions that demonstrate an understanding of knowledge being assessed.
2) Preparation and justification of a reasonable solution to a problem scenario.

B. Hands-on exercises or simulations to demonstrate acquisition of knowledge and skills that could:

1) Apply relevant knowledge or skills
2) Focus on the application of knowledge and skills to a new situation
3) Demonstrate an ability to plan, organize, and create a product, service, or an event.
4) Illustrate by individual performance the attained levels of knowledge and skills
5) Include observation of events, groups, and individuals that focuses on the relevant traits of the skill in question

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 4. Follow Safety Procedures		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
4.1 Respond to emergencies	4.1.1 Technician responds appropriately to facility public address alerts and codes 4.1.2 Technician responds appropriately to internal and external emergencies 4.1.3 Technician responds appropriately to emergency and disaster drills 4.1.4 Technician participates in mandatory annual safety training and achieves satisfactory scores on both written and performance assessments	Health Information Portability and Accountability Act (HIPAA) Familiarity with medical terminology Standard biological precautions Knowledge of OSHA standards Public Address alerts and codes Awareness of Emergency Care Research Institute (ECRI) notifications	Personal protective equipment (PPE) Computerized Maintenance Management System (CMMS) Material safety data sheets Spill kits
4.2 Ensure public and employee safety in the healthcare facility	4.2.1 Technician wears personal protective equipment appropriate for the particular installation/maintenance activity and for the area of the facility 4.2.2 Technician works with clinical staff to ensure restricted access to areas of work as necessary 4.2.3 Technician demonstrates respect for dignity and privacy of patients and clients in facility as reflected in patient satisfaction surveys	Health Information Portability and Accountability Act (HIPAA) Standard biological precautions Knowledge of OSHA standards Knowledge of electrical safety standards such as NFPA 99 Knowledge of ANSI standards Knowledge of TJC (JCAHO) standards Public Address alerts and codes Awareness of Emergency Care Research Institute (ECRI) notifications	Chemical cleaning supplies Personal protective equipment (PPE) Diagnostic software Personal protective equipment Computerized Maintenance Management System (CMMS) Material safety data sheets Spill kits
4.3 Identify hazards in and around work areas	4.3.1 Technician sets up barriers as appropriate 4.3.2 Technician reports hazards to proper personnel for remediation 4.3.3 Technician ensures proper signage posted in area and, if necessary, reports to safety committee through supervisor.	Fundamentals of electricity and electronics Standard biological precautions Knowledge of OSHA standards Knowledge of electrical safety standards such as NFPA 99 Knowledge of ANSI standards Knowledge of TJC (JCAHO) standards Awareness of Emergency Care Research Institute (ECRI) notifications	Personal protective equipment (PPE) Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Academic and Employability Knowledge and Skill Matrix for Critical Work Function 4: Follow Safety Procedures

On a scale of 1 (lowest) to 5 (highest), identify the level of complexity required in each of these skills for the worker to perform the critical work function. Keep in mind that this scale is not for rating an individual's proficiency. It is intended only for rating the level of complexity required to do the work.

Occupational Title: Biomedical Equipment Technician																
CWF 4																
Listening	Speaking	Using Information and Communication Technology	Gathering and analyzing Information	Analyzing and Solving Problems	Making Decisions and Judgments	Organizing and Planning	Using Social Skills	Adaptability	Working in Teams	Leading Others	Building Consensus	Self and Career Development	Writing	Reading	Mathematics	Science
3	3	3	2	2	3	2	3	2	3	3	2	3	2	3	1	1

Statement of Assessment for Critical Work Function 4:

The statements of assessment can do any of several things:

- *Define tools or strategies that industry could use to assess the level of competency a worker has attained in a particular critical work function.*
- *Define for trainers and educators how to assess the level of competency a student has attained relevant to the critical work function.*
- *Define the level of mastery of the critical work function that indicates that a worker or student has achieved an entry-, intermediate-, or advanced level of mastery of a critical work function.*

A. Tests could include:

1) Multiple choice and essay questions that demonstrate an understanding of knowledge being assessed.
2) Preparation and justification of a reasonable solution to a problem scenario.

B. Hands-on exercises or simulations to demonstrate acquisition of knowledge and skills that could:

1) Apply relevant knowledge or skills
2) Focus on the application of knowledge and skills to a new situation
3) Demonstrate an ability to plan, organize, and create a product, service, or an event.
4) Illustrate by individual performance the attained levels of knowledge and skills
5) Include observation of events, groups, and individuals that focuses on the relevant traits of the skill in question

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 5. Manage Documentation		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
5.1 Maintain equipment, parts, and inventory database	5.1.1 Technician documents justification of necessity for parts stock and quantity 5.1.2 CMMS reflects actual inventory levels of parts and equipment	Medical Device Data Systems (MDDS) Familiarity with medical terminology Knowledge of electrical safety standards such as NFPA 99 Knowledge of ANSI standards	Computerized Maintenance Management System (CMMS)
5.2 Assist with equipment recalls and health device alerts (HDAs)	5.2.1 Return documentation complete with all required data including service numbers, model numbers, etc., according to recall instructions 5.2.2 Action is annotated within CMMS according to departmental policy	Medical Device Data Systems (MDDS) Health Information Portability and Accountability Act (HIPAA) Network protocols Familiarity with medical terminology Standard biological precautions Knowledge of TJC (JCAHO) standards Awareness of Emergency Care Research Institute (ECRI) notifications	Personal protective equipment (PPE) Computerized Maintenance Management System (CMMS)
5.3 Update equipment maintenance documentation	5.3.1 Maintenance documentation starts with Incoming Inspection, all corrective action and preventive maintenance notations, manufacturer and/or service support documents, and equipment final disposition 5.3.2 Management reports reflect all appropriate equipment histories	Medical Device Data Systems (MDDS) Familiarity with medical terminology Knowledge of electrical safety standards such as NFPA 99 Knowledge of ANSI standards Knowledge of TJC (JCAHO) standards	Computerized Maintenance Management System (CMMS)

Academic and Employability Knowledge and Skill Matrix for Critical Work Function 5: Manage Documentation

On a scale of 1 (lowest) to 5 (highest), identify the level of complexity required in each of these skills for the worker to perform the critical work function. Keep in mind that this scale is not for rating an individual's proficiency. It is intended only for rating the level of complexity required to do the work.

Occupational Title: Biomedical Equipment Technician																
CWF 5																
Listening	Speaking	Using Information and Communication Technology	Gathering and analyzing Information	Analyzing and Solving Problems	Making Decisions and Judgments	Organizing and Planning	Using Social Skills	Adaptability	Working in Teams	Leading Others	Building Consensus	Self and Career Development	Writing	Reading	Mathematics	Science
2	2	3	3	2	3	2	2	2	2	2	2	2	2	3	2	1

Statement of Assessment for Critical Work Function 5:

The statements of assessment can do any of several things:

- *Define tools or strategies that industry could use to assess the level of competency a worker has attained in a particular critical work function.*
- *Define for trainers and educators how to assess the level of competency a student has attained relevant to the critical work function.*
- *Define the level of mastery of the critical work function that indicates that a worker or student has achieved an entry-, intermediate-, or advanced level of mastery of a critical work function.*

A. Tests could include:

1) Multiple choice and essay questions that demonstrate an understanding of knowledge being assessed.
2) Preparation and justification of a reasonable solution to a problem scenario.

B. Hands-on exercises or simulations to demonstrate acquisition of knowledge and skills that could:

1) Apply relevant knowledge or skills
2) Focus on the application of knowledge and skills to a new situation
3) Demonstrate an ability to plan, organize, and create a product, service, or an event.
4) Illustrate by individual performance the attained levels of knowledge and skills
5) Include observation of events, groups, and individuals that focuses on the relevant traits of the skill in question

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 6. Schedule and Oversee Third Party Work		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
6.1 Coordinate resources to facilitate repairs	6.1.1 Technician identifies vendor and verifies that vendor contract is valid 6.1.2 Technician properly prioritizes the repair time frame 6.1.3 Repair priority and time frame accurately communicated to third party vendor	Medical Device Data Systems (MDDS) Medical device integration Familiarity with medical terminology Knowledge of electrical safety standards such as NFPA 99 Proper lifting techniques	Test Equipment Computerized Maintenance Management System (CMMS)
6.2 Conduct quality assurance check of third party repairs	6.2.1 Equipment installed or repaired by third party is configured and performs to users' requirements 6.2.2 Work order indicates installation or repairs by third party meet NFPA 99 electrical safety standard 6.2.3 Work order indicates performance verification (functional) test passed successfully 6.2.4 Third party has provided full documentation of completed work for technician input into facility CMMS	Function and operation of monitoring systems Function and operation of portable equipment Function and operation of life support equipment Function and operation of therapeutic equipment Function and operation of laboratory equipment Function and operation of diagnostic imaging equipment Function and operation of electrical safety test equipment Function and operation of defibrillator test equipment Function and operation of electro-surgical test equipment Function and operation of physiologic simulators Function and operation of oscilloscopes Function and operation of diagnostic equipment Medical Device Data Systems (MDDS) Network protocols Medical device integration Fundamentals of electricity and electronics Familiarity with medical terminology Standard biological precautions Knowledge of electrical safety standards such as NFPA 99 Knowledge of ANSI standards Knowledge of TJC (JCAHO) standards	Electrical safety analyzer Test equipment Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 6. Schedule and Oversee Third Party Work		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
6.3 Verify third party documentation of repairs	6.3.1 Equipment is configured and performs to users' requirements 6.3.2 Installation work order indicates electrical safety test passed and meets NFPA 99 standards 6.3.3 Work order indicates performance verification (functional) test passed successfully 6.3.4 Installation is documented in CMMS with all relevant checklists complete	Medical Device Data Systems (MDDS) Network protocols Familiarity with medical terminology Knowledge of electrical safety standards such as NFPA 99 Knowledge of TJC (JCAHO) standards Proper lifting techniques Public Address alerts and codes	Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Academic and Employability Knowledge and Skill Matrix for Critical Work Function 6: Schedule and Oversee Third Party Work

On a scale of 1 (lowest) to 5 (highest), identify the level of complexity required in each of these skills for the worker to perform the critical work function. Keep in mind that this scale is not for rating an individual's proficiency. It is intended only for rating the level of complexity required to do the work.

Occupational Title: Biomedical Equipment Technician																
CWF 6																
Listening	Speaking	Using Information and Communication Technology	Gathering and analyzing Information	Analyzing and Solving Problems	Making Decisions and Judgments	Organizing and Planning	Using Social Skills	Adaptability	Working in Teams	Leading Others	Building Consensus	Self and Career Development	Writing	Reading	Mathematics	Science
3	3	2	3	2	2	3	3	3	2	2	2	3	2	2	1	2

Statement of Assessment for Critical Work Function 6

The statements of assessment can do any of several things:

- *Define tools or strategies that industry could use to assess the level of competency a worker has attained in a particular critical work function.*
- *Define for trainers and educators how to assess the level of competency a student has attained relevant to the critical work function.*
- *Define the level of mastery of the critical work function that indicates that a worker or student has achieved an entry-, intermediate-, or advanced level of mastery of a critical work function.*

A. Tests could include:

1) Multiple choice and essay questions that demonstrate an understanding of knowledge being assessed.
2) Preparation and justification of a reasonable solution to a problem scenario.

B. Hands-on exercises or simulations to demonstrate acquisition of knowledge and skills that could:

1) Apply relevant knowledge or skills
2) Focus on the application of knowledge and skills to a new situation
3) Demonstrate an ability to plan, organize, and create a product, service, or an event
4) Illustrate by individual performance the attained levels of knowledge and skills
5) Include observation of events, groups, and individuals that focuses on the relevant traits of the skill in question

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 7. Provide Technical Assistance and Instruction on Equipment Operation and Maintenance		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
7.1 Demonstrate equipment for facility staff	7.1.1 Technician describes equipment use based on manufacturer documentation or checklist 7.1.2 Demonstration participant sign-in sheet verified by supervisor 7.1.3 Favorable technician feedback received during supervisor rounds (zone inspection rounds)	Function and operation of monitoring systems Function and operation of portable equipment Function and operation of life support equipment Function and operation of therapeutic equipment Function and operation of laboratory equipment Function and operation of diagnostic imaging equipment Function and operation of electrical safety test equipment Function and operation of defibrillator test equipment Function and operation of electro-surgical test equipment Function and operation of physiologic simulators Function and operation of diagnostic equipment Network protocols Medical device integration Familiarity with medical terminology Knowledge of electrical safety standards such as NFPA 99 Knowledge of ANSI standards Knowledge of TJC (JCAHO) standards	Spectrum analyzer Electrical safety analyzer Patient simulators (e.g. SpO_2 simulator) Fetal monitor simulator Personal protective equipment (PPE) Cabling, terminals Diagnostic software Test equipment Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 7. Provide Technical Assistance and Instruction on Equipment Operation and Maintenance		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
7.2 Respond to user requests for assistance	7.2.1 Technician properly assesses response requirement 7.2.2 Technician responds to assistance request according to its priority	Function and operation of monitoring systems Function and operation of portable equipment Function and operation of life support equipment Function and operation of therapeutic equipment Function and operation of laboratory equipment Function and operation of diagnostic imaging equipment Function and operation of electrical safety test equipment Function and operation of defibrillator test equipment Function and operation of electro-surgical test equipment Function and operation of physiologic simulators Function and operation of diagnostic equipment Medical Device Data Systems (MDDS) Health Information Portability and Accountability Act (HIPAA) Network protocols Medical device integration Fundamentals of electricity and electronics Familiarity with medical terminology Standard biological precautions Knowledge of electrical safety standards such as NFPA 99 Knowledge of TJC (JCAHO) standards	Hand tools Electrical safety analyzer Personal protective equipment (PPE) Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Occupational Title: Biomedical Equipment Technician			
Critical Work Function 7. Provide Technical Assistance and Instruction on Equipment Operation and Maintenance		**Occupational Skills, Knowledge & Conditions**	
Key Activity	**Performance Criteria** *How do we know when the key activity is performed well or performed successfully?*	**Occupational Skills & Knowledge** *What should the technician know and what skills should the technician have in order to do the activity?*	**Conditions** *What tools must the technician use in order to do the activity?*
7.3 Identify need for in-service presentations	7.3.1 Technician identifies trends of clinical errors and offers relevant in-service instruction to staff as approved 7.3.2 Technician facilitates interdepartmental cooperation in compliance with TJC (JCAHO) guidelines	Function and operation of monitoring systems Function and operation of portable equipment Function and operation of life support equipment Function and operation of therapeutic equipment Function and operation of laboratory equipment Function and operation of diagnostic imaging equipment Function and operation of electrical safety test equipment Function and operation of defibrillator test equipment Function and operation of electro-surgical test equipment Function and operation of physiologic simulators Function and operation of diagnostic equipment Medical Device Data Systems (MDDS) Network protocols Medical device integration Fundamentals of electricity and electronics Familiarity with medical terminology Standard biological precautions Knowledge of electrical safety standards such as NFPA 99 Knowledge of TJC (JCAHO) standards	Computerized Maintenance Management System (CMMS)

BIOMEDICAL EQUIPMENT TECHNICIAN SKILL STANDARDS

Academic and Employability Knowledge and Skill Matrix for Critical Work Function 7: Provide Technical Assistance and Instruction on Equipment Operation

On a scale of 1 (lowest) to 5 (highest), identify the level of complexity required in each of these skills for the worker to perform the critical work function. Keep in mind that this scale is not for rating an individual's proficiency. It is intended only for rating the level of complexity required to do the work.

Occupational Title: Biomedical Equipment Technician																
CWF 7																
Listening	Speaking	Using Information and Communication Technology	Gathering and analyzing Information	Analyzing and Solving Problems	Making Decisions and Judgments	Organizing and Planning	Using Social Skills	Adaptability	Working in Teams	Leading Others	Building Consensus	Self and Career Development	Writing	Reading	Mathematics	Science
2	3	3	3	3	3	3	3	3	2	3	3	3	2	3	2	2

Statement of Assessment for Critical Work Function 7

The statements of assessment can do any of several things:

- *Define tools or strategies that industry could use to assess the level of competency a worker has attained in a particular critical work function.*
- *Define for trainers and educators how to assess the level of competency a student has attained relevant to the critical work function.*
- *Define the level of mastery of the critical work function that indicates that a worker or student has achieved an entry-, intermediate-, or advanced level of mastery of a critical work function.*

A. Tests could include:

1) Multiple choice and essay questions that demonstrate an understanding of knowledge being assessed.
2) Preparation and justification of a reasonable solution to a problem scenario.

B. Hands-on exercises or simulations to demonstrate acquisition of knowledge and skills that could:

1) Apply relevant knowledge or skills
2) Focus on the application of knowledge and skills to a new situation
3) Demonstrate an ability to plan, organize, and create a product, service, or an event
4) Illustrate by individual performance the attained levels of knowledge and skills
5) Include observation of events, groups, and individuals that focuses on the relevant traits of the skill in question