

AAMI CBET ALIGNMENT WHITE PAPER

Bridging Academic Preparation and CBET Certification Using the iWorx BMET Kit

How hands-on bioinstrumentation and simulated signal fault isolation accelerate student competency across core certification domains.

EXECUTIVE SUMMARY

Preparing students for the Certified Biomedical Equipment Technician (CBET®) exam—administered by the AAMI Credentials Institute (ACI)—requires balancing theoretical knowledge with applied clinical and technical skills. The iWorx BMET Kit (BMET-TR) serves as a key experiential learning bridge. By combining hands-on signal processing, sensor simulation, electrical troubleshooting, and real-time data analysis via LabScribe software, the iWorx kit directly targets the core domains assessed on the CBET examination.

1. Introduction: The CBET Competency Challenge

The CBET certification validates a technician's ability to maintain, troubleshoot, calibrate, and ensure the safety of complex medical devices in healthcare facilities. The exam evaluates candidates across six key domain areas requiring both conceptual understanding and pragmatic field capabilities.

Traditional BMET programs often separate academic instruction (anatomy, physiology, and electrical engineering theory) from clinical equipment labs. The iWorx BMET Kit closes this divide by integrating physiological signal acquisition, circuit testing, and bioinstrumentation analysis into interactive, practical laboratory exercises.

2. Alignment with CBET Exam Domains

The table below details how the iWorx BMET Kit laboratory exercises map directly to the weightings and content areas of the CBET certification outline.

CBET Exam Domain	Total Exam Weight	iWorx Covers	iWorx BMET Kit Practical Mapping
Anatomy & Physiology	7%	3/3	Hands-on investigation of cardiovascular, muscular, and other physiological systems

			through ECG, pulse, blood pressure, EMG, nerve conduction, reflex, and exercise experiments.
Fundamentals of Electricity & Electronics	6%	1/2	Analysis of fundamental electronic circuits, with labs including Ohm's Law, series and parallel circuits, voltage dividers, semiconductors, RC/RL circuits, passive and active filters, instrumentation amplifiers and operational amplifiers.
Healthcare Information Technology	17%	1/6	Hands-on setup and troubleshooting of biomedical system hardware, including acquisition components, cables, connectors, and related hardware used to collect physiological data.
Healthcare Technology and Function	30%	5/11	Operation and analysis of biomedical instrumentation used for physiological measurement, including ECG, EMG, blood pressure, pulse oximetry, and temperature.
Healthcare Technology Problem Solving	30%	3/11	Hands-on troubleshooting through intentional fault insertion, signal distortion and systematic identification and correction of faults.
Public Safety in Healthcare Facilities	10%	0/6	The BMET-TR does not directly address the CBET concepts in this domain, including healthcare safety standards and regulations, infection control, CMS/accreditation, AAMI standards, or CMMS.

3. CBET Outcomes and iWorx Implementation

3.1 Anatomy and Physiology

Concept	Covered by BMET-TR?
Understand the functions and basic abnormal functions of the physiological systems (including, Circulatory, Respiratory, Gastrointestinal, Nervous, Musculoskeletal, Endocrine).	Yes

Identify major components and the major functions of the primary organs (including, Heart, Lungs, Brain, Skin).	Yes
---	-----

Understand basic medical terminology.	Yes
---------------------------------------	-----

3.2 Fundamentals of Electricity and Electronics

Concept	Covered by BMET-TR?
Apply foundational electronic theories as they apply to voltage, resistance, current, power (Ohm's law), active and passive devices, including the use of schematics to troubleshoot.	Yes
Understand the purpose and usage of various power conditioning, distribution, and storage systems (including LIM, Transformers, Batteries, UPS).	No

3.3 Healthcare Information Technology

Concept	Covered by BMET-TR?
Understand and apply protective standards and regulations for protected data (for example, Health Insurance Portability and Accountability Act [HIPAA], NIST framework, HITRUST, HHS Cyber security performance goals)	No
Troubleshoot system hardware (for example, power supplies, peripherals, hard drives, cables, connectors)	Yes
Troubleshoot, update, and patch system software (for example, Windows, Office, Linux, Unix)	No
Troubleshoot wired and wireless networks and networking components (for example, routers, switches, access points, access point controllers, KVMs, cables, virtual servers, LAN, WAN, cloud computing) using diagnostic tools or process (for example, cable tracers, PING, networking commands).	No
Understand and troubleshoot the integration of medical devices direct to EMR or by use of middleware.	No
Understand basic system identifiers and terminology (for example, IP, MAC).	No

3.4 Healthcare Technology and Function

Concept	Covered by BMET-TR?
Understand physiological concepts as applicable to healthcare technology (for example, Korotkoff sounds, Einthoven's triangle, QRS, dicrotic notch).	Yes

Understand normal function, use, and underlying technology of test equipment (for example, electrical safety analyzer, defibrillator analyzer, electro surgical analyzer, physiologic simulators, DVM, meters).	No
Understand physiological measurements and their applications (for example, mmHg, PSI, Bar, Fahrenheit, cm H ₂ O, lumens, joules).	Yes
Understanding the normal function of monitoring systems (for example, fetal monitor, telemetry, physiological monitor, vital signs)	Yes
Understand normal function and underlying technology of monitoring parameters (for example, EtCO ₂ , ECG, EEG, NIBP, IBP, oximetry, TOCO, FHR, respiration, temperature).	Yes
Understand normal function and underlying technology of diagnostic equipment (for example, otoscope, ophthalmoscope, scales, stress test, audiometer, ECG, spirometer, ultrasound).	Yes
Understand normal function and underlying technology of infusion equipment (including, feeding pumps, LVP, syringe pumps, PCA, injectors).	No
Understand normal function and underlying technology of therapeutic equipment (for example, neonatal/pediatric equipment, patient temperature management equipment, aspiration equipment, SCD, physical therapy equipment).	No
Understand normal function and underlying technology of perioperative equipment (for example, ESUs, video integration equipment, tourniquets, sterilization equipment, fluid warmer, tables, lights, surgical microscopes).	No
Understand normal function and underlying technology of life support equipment (for example, defibrillators, anesthesia machines, ventilators, balloon pumps, external pacemakers).	No
Understand normal function of laboratory equipment (for example, centrifuges, incubators, rockers, refrigerators, freezers, microscopes, water baths, analyzers, cryostats, microtomes).	No

3.5 Healthcare Technology Problem Solving

Concept	Covered by BMET-TR?
Identify and resolve fault conditions of modules/subsystems including power supplies.	Yes
Prioritize repairs of medical devices based on level of risk, urgency, and potential downtime.	No
Differentiate between a device error and a use error to determine appropriate action.	No
Provide education to staff on proper use of equipment and can effectively communicate verbally and in writing with, including but not limited to, clinicians, other hospital personnel, and manufacturers about technical issues and projects (in-service or cross-training).	No

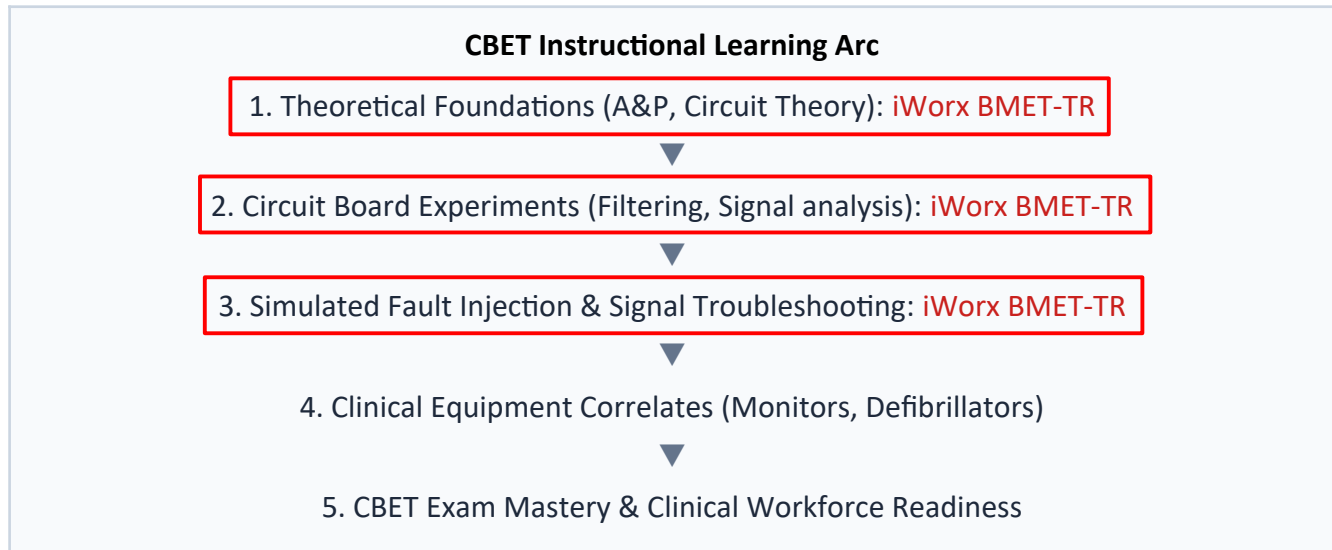
Differentiate between an issue with a localized monitoring device on a network and a system-wide problem.	No
Identify the fault conditions and apply appropriate corrective action for monitoring systems (for example, fetal monitor, telemetry, physiological monitor, vital signs).	Yes
Identify the fault conditions and apply appropriate corrective action for diagnostic equipment (for example, otoscope, ophthalmoscope, scales, stress test, audiometer, ECG, spirometer).	Yes
Identify the fault conditions and apply appropriate corrective action for infusion equipment (including, feeding pumps, LVP, syringe pumps, PCA, injectors).	No
Identify the fault conditions and apply appropriate corrective action for therapeutic equipment (for example, neonatal/pediatric equipment, patient temperature management equipment, aspiration equipment, SCD, physical therapy equipment).	No
Identify the fault conditions and apply appropriate corrective action for perioperative equipment (for example, ESUs, video integration equipment, tourniquets, sterilization equipment, fluid warmer, tables, lights, surgical microscopes).	No
Identify the fault conditions and apply appropriate corrective action for laboratory equipment (for example, centrifuges, incubators, rockers, refrigerators, freezers, microscopes, water baths, analyzers, cryostats, microtomes).	No

3.6 Public Safety in the Healthcare Facility

Concept	Covered by BMET-TR?
Understand electrical safety requirements (NFPA99 and IEC60601) for the use of medical equipment (for example, micro and macro shock, power cord color coding, GFCI, electrical safety limits).	No
Understand the use of safety data sheets, identify standard hazard symbolism and signage (for example, laser, MRI, ionizing radiation, patient precautions).	No
Understand universal precautions, determine appropriate infection control procedures and proper use of PPE.	No
Understand the role and function of CMS, and the organizations having authority to accredit on behalf of CMS.	No
Understand the ANSI/AAMI standards including EQ56 (medical equipment programs), EQ89 (scheduled maintenance and performance), EQ93 (medical equipment vocabulary), and EQ103 (AEM)	No
Understand how to efficiently navigate and utilize the CMMS to document maintenance activities, track equipment history, and generate reports for compliance and performance	No

analysis.

4. Academic & Institutional Impact



Integrating the iWorx BMET kit into a Biomedical Engineering Technology curriculum delivers three major benefits:

- **Preparation for Student Success:** Provides targeted hands-on practice for the two largest sections of the exam (Healthcare Technology & Function and Problem Solving).
- **Standardized Lab Curriculum:** Delivers step-by-step experiment manuals and software setups, reducing prep time for instructors.
- **Career Readiness:** Equips graduates with realistic troubleshooting skills, making them immediately effective in hospital HTM (Healthcare Technology Management) departments and field service roles.

Conclusion

The iWorx BMET Kit aligns academic instruction with AAMI CBET certification standards. By turning abstract concepts into measurable, hands-on lab experiences, educational institutions can better prepare students to pass the CBET exam and succeed in the biomedical technology workforce.