



Program: Manufacturing & Technology Program

Assessment period: 2021-2022

Program or Department Mission:

The mission of the Jefferson State Community College industrial Maintenance Technology Program is to prepare entry level Industrial Technology professionals who are competent, ethical, and have a good sense of work ethics. Coursework includes a strong component of practical applications, hands-on laboratory experience and industrial technology concepts. Computer applications are an integral part of the curriculum. Graduates offer their employers an immediate contribution as significant contributors equipped with a combination of technical knowledge, problem-solving experience, and communication skills.

Further, the Industrial Maintenance Technology program will continuously pursue a highly qualified faculty which constantly strives for excellence in pedagogy. Besides having technical acumen in the field of Industrial Maintenance Technology, the selected faculty will be sensitive to the educational needs and capabilities of the Industrial Maintenance Technology learners. These needs are also reflective to the changing landscape and on-going concerns of the Industrial Maintenance Technology industry.

Instructional Program Student Learning Outcomes & Assessment Plan

- SLO 1** - Recognize Safety Hazards in the workplace and demonstrate methods to eliminate or mitigate the hazards.
- SLO 2**- Integrate knowledge of physics, mathematics, mechanics, electronics, fluid power, computers, and programming into the fabrication, installation, testing, and servicing/troubleshooting of electromechanical systems
- SLO 3** - Demonstrate proficiency in advanced CADD skills by creating complex drawings using wire-frame and solid-modeling techniques
- SLO 4** - Perform the duties of an entry-level technician in the maintenance/troubleshooting of industrial systems

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence	Use of Results
<p>SLO 1 Recognize Safety Hazards in the workplace and demonstrate methods to eliminate or mitigate the hazards.</p>	<p>Demonstration of the safety skill: Lockout/Tagout procedure in: <u>AUT 130</u> <u>MET 201</u> <u>ELM 205</u> <u>MET 190</u> <u>ELM 200</u></p>	<p>90% of technical learners will be able to perform Lockout/Tagout procedure reaching Skill Level 4</p>	<p>Total students: 74 Skill level 1: 5% of the 74 learners where able to achieve this mastery skill level for this learning outcome Skill level 2: 40% of the 74 learners where able to integrate these skills and achieve this mastery skill level for this Skill level 3: 20% of the 74 learners where able to achieve this mastery skill level for this learning outcome Skill level 4: 35% of the 74 learners where able to perform duties of and entry level technician.</p>	<p>In order to strengthen this skill set in students moving forward, the instructor will make the following changes/adjustments:</p> <ol style="list-style-type: none"> 1. Create project learning assignments that allow the use and demonstration of safety skills in electrical safety procedures. 2. Continue to allow incumbent technicians to assist with novice learners in obtaining authentic entry level technician skills in industrial safety hazards practices. 3. Include technical learners writing reflective papers to demonstrated communicating safety hazards knowledge and practices for industrial-manufacturing facilities.

<p>SLO 2 Integrate knowledge of physics, mathematics, mechanics, electronics, fluid power, computers, and programming into the fabrication, installation, testing, and servicing/troubleshooting of electromechanical systems</p>	<p>Assessment of skills in <u>ELM 205</u>. Demonstrate Setup of measuring electrical circuit parameters of halfwave rectifier power supply.</p>	<p>At least 75% of the technical learners will be able to present the semiconductor theory on the silicon diode using a formative method to reach Skill Level 3.</p>	<p>Total students: 9 Skill level 1: 5% of the 9 learners were able to achieve this mastery skill level for this learning outcome. Skill level 2: 35% of the 9 learners were able to achieve this mastery skill level for this learning outcome. Skill level 3: 20% of the 9 learners were able to achieve this mastery skill level for this learning outcome. Skill level 4: 45% of the 9 learners were able to achieve this mastery skill level for this learning outcome.</p>	<p>In order to strengthen this skill set in students moving forward, the instructor will make the following changes/adjustments:</p> <ol style="list-style-type: none"> 1. Incorporate more physic, mathematics based problem sets to improve cognitive knowledge in these subject areas. 2. Create project learning assignments that allow the use and demonstration of computer skills to manufacturing and industrial applications. 3. Continue to allow incumbent technicians to assist with novice learners in obtaining authentic entry level technician skills. 4. Include technical learners writing reflective papers to demonstrate communicating a 3 step analytic (math) procedure to solving a
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	<p>Assessment of skills in <u>ELM 200</u>. Perform a troubleshooting task of a DC series-parallel circuit.</p>	<p>At least 75% of the technical learners will be able to diagnose and troubleshoot a DC series-parallel circuit to reach Skill Level 4.</p>	<p>Total students: 21 Skill level 1: 10% of the 21 learners were able to achieve this mastery skill level for this learning outcome. Skill level 2: 35% of the 21 learners were able to achieve this mastery skill level for this learning outcome. Skill level 3: 25% of the 21 learners were able to achieve this mastery skill level for this learning outcome. Skill level 4: 35% of the 21 learners were able to achieve this mastery skill level for this learning outcome.</p>	<p>halfwave rectifier power supply.</p> <p>5. Create homebased labs that allow learners to practice electrical safety procedures in breadboarding (wiring) electrical circuits.</p> <p>In order to strengthen this skill set in students moving forward, the instructor will make the following changes/adjustments:</p> <ol style="list-style-type: none"> 1. Incorporate more physic, mathematics based problem sets to improve cognitive knowledge in these subject areas. 2. Create project learning assignments that allow the use and demonstration of computer skills (using Multisim Online) to manufacturing and industrial applications. 3. Include technical learners writing
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				<p>reflective papers to demonstrate communicating a 3 step analytic (math) procedure to solving a DC series-parallel circuit.</p> <p>4. Create homebased labs that allow learners to practice in breadboarding (wiring) DC series-parallel circuits.</p>
<p>SLO 3 Demonstrate proficiency in advanced CADD skills by creating complex drawings using wire-frame and solid-modeling techniques</p>	<p>Assessment of skills in <u>MET 201</u>.</p> <p>Demonstrate Setup of AutoDesk AutoCAD design layout using the specialized drawing toolbars.</p>	<p>At least 75% of the technical learners will be able to setup a drawing layout using the drawing toolbars to reach Skill Level 4.</p>	<p>Total students: 4 Skill level 1: 5% of the 4 learners were able to achieve this mastery skill level for this learning outcome. Skill level 2: 5% of the 4 learners were able to achieve this mastery skill level for this learning outcome. Skill level 3: 10% of the 4 learners were able to achieve this mastery skill level for this learning outcome. Skill level 4: 80% of the 4 learners were able to achieve this mastery skill level for this learning outcome.</p>	<p>In order to strengthen this skill set in students moving forward, the instructor will make the following changes/adjustments:</p> <ol style="list-style-type: none"> 1. Create project learning assignments that allow the use and demonstration of CAD skills to manufacturing and industrial applications. 2. Create learning activities that introduce creating wire-frame and solid modeling techniques using AutoCAD and Free CAD software.

				<p>3. Include technical learners writing reflective papers to demonstrate competency in discussing a process to print a solid model using a 3D printer.</p>
<p>SLO 4 Perform the duties of an entry-level technician in the maintenance/troubleshooting of industrial systems</p>	<p>Assessment of skills in <u>AUT 130</u>.</p> <p>Create basic pneumatic circuit consisting of a double acting cylinder a directional control valve (DCV).</p>	<p>At least 75% of the technical learners will be able to create a basic pneumatic circuit electrical symbol to reach Skill Level 4</p>	<p>Total students: 15 Skill level 1: 10% of the 15 learners were able to achieve this mastery skill level for this learning outcome. Skill level 2: 5% of the 15 learners were able to achieve this mastery skill level for this learning outcome. Skill level 3: 25% of the 15 learners were able to achieve this mastery skill level for this learning outcome. Skill level 4: 60% of the 15 learners were able to achieve this mastery skill level for this learning outcome.</p>	<p>In order to strengthen this skill set in students moving forward, the instructor will make the following changes/adjustments:</p> <ol style="list-style-type: none"> 1. Continue to allow incumbent technicians to assist with novice learners in obtaining authentic entry level technician skills in troubleshooting and maintaining pneumatic circuits. 2. Discuss troubleshooting techniques for pneumatic and hydraulic circuits 3. Create lab assignments that allow technical learners to demonstrate

				<p>knowledge of pneumatic and hydraulic systems designing air and fluid circuits.</p> <p>4. Include technical learners writing reflective papers to demonstrate competency in physics of a pneumatic circuit using Pascal's Law.</p> <p>5. Have technical learners demonstrate how to air flow in pneumatic circuit using an air pressure gauge.</p>
Plan submission date:			Submitted by: Dr. Don Wilcher	



Assessment Record

Program: Biomedical Equipment Technology

**Assessment
period:**

2021 - 2022

Program or Department Mission:

The mission of the Manufacturing and Technology Program (Biomedical Equipment Technology Option) at Jefferson State Community College is to prepare students to enter the field of medical equipment repair as competent and entry level technicians. The Program exists to supply the medical industry with qualified people to maintain and repair the equipment found in various medical facilities such as hospitals, clinics and medical equipment manufacturers. We are committed to accomplishing this mission by properly educating the students via theory and hands on application.

Instructional Program Student Learning Outcomes & Assessment Plan

Intended Outcomes	Means of Assessment	Criteria for Success	Summary & Analysis of Assessment Evidence	Use of Results
1. Students enrolled into the BET program	1. During their course of study in the BET	1. Students participating in the	1. Scale Used	The Clinical On-Site Study employer feedback is a key

<p>will complete the program as technically competent individuals able to service and maintain medical equipment in a safe and proficient manner.</p>	<p>concentration curriculum, students are required to complete several hands-on experiments and lab assignments.</p>	<p>concentration cohort of the BMET option (as a whole) will earn a <u>Clinical On-Site Study Electrical Safety Analyzer Performance Class</u> Average Score of at least (2) in BET 240</p>	<table border="1" data-bbox="1262 196 1465 613"> <thead> <tr> <th>Points</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>A</td> </tr> <tr> <td>3</td> <td>B</td> </tr> <tr> <td>2</td> <td>C</td> </tr> <tr> <td>1</td> <td>D</td> </tr> <tr> <td>0</td> <td>F</td> </tr> </tbody> </table> <p>Class Average Goal</p> <p><i>2 Points or Higher</i></p> <p>Class Average – 3.2</p>	Points	Grade	4	A	3	B	2	C	1	D	0	F	<p>indicator used by the program to assess methods used to train and prepare students for real world performance within the industry. <u>The 3.8 Class Average</u> shown in the rubric indicates that students were well prepared and performed at an above average level.</p> <p>An example of this is address in ELM 205. Students have to demonstrate an understanding of the Diode map and other electrical components.</p>
Points	Grade															
4	A															
3	B															
2	C															
1	D															
0	F															
<p>2. Students will demonstrate the ability to work effectively with other technicians as a team.</p>	<p>2. During their course of study in the BET concentration curriculum, students will often complete the hands-on experiment assignments as a member of a team.</p>	<p>2. Students participating in the concentration cohort of the BMET option (as a whole) will (working as a team) earn a <u>Clinical On-Site Study Communication, Professionalism and Teamwork Performance Class</u></p>	<p>2. Scale Used</p> <table border="1" data-bbox="1262 1024 1465 1377"> <thead> <tr> <th>Points</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>A</td> </tr> <tr> <td>3</td> <td>B</td> </tr> <tr> <td>2</td> <td>C</td> </tr> <tr> <td>1</td> <td>D</td> </tr> </tbody> </table>	Points	Grade	4	A	3	B	2	C	1	D	<p>The Clinical On-Site Study employer feedback is a key indicator used by the program to assess methods used to train and prepare students for real world performance within the industry were very well prepared with regards to</p>		
Points	Grade															
4	A															
3	B															
2	C															
1	D															

		Average Score of at least (2) in BET 240	<table border="1"> <tr> <td>0</td> <td>F</td> </tr> </table> <p>Class Average Goal 2 Points or Higher</p> <p>Class Average – 2.5</p>	0	F	<u>Professionalism and Teamwork</u>										
0	F															
3. Utilize effective written communication and maintain medical record and equipment preventive maintenance forms.	3. To introduce students to the importance of proper documentation, labs and assignments in BET 241 requires students to submit a research paper centered on Law and Legal Issues in the medical profession. This research must be presented in a particular format just as they would when using a BMET Equipment Database.	3. Students participating in the concentration cohort of the BMET option (as a whole) will earn a <u>Law & Legal Research Final Draft Research Paper Class Average Score</u> of at least (2) in BET 241.	<p>3. Scale Used</p> <table border="1"> <thead> <tr> <th>Points</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>A</td> </tr> <tr> <td>3</td> <td>B</td> </tr> <tr> <td>2</td> <td>C</td> </tr> <tr> <td>1</td> <td>D</td> </tr> <tr> <td>0</td> <td>F</td> </tr> </tbody> </table> <p>Class Average Goal 2 Points or Higher</p> <p>Class Average – 2.9</p>	Points	Grade	4	A	3	B	2	C	1	D	0	F	The assessment outcomes of BET241 indicates that students have a basic understanding of the different types of legalities that exist within the profession. It also indicates that the students understand the importance of attention to detail with regards to research and documentation..
Points	Grade															
4	A															
3	B															
2	C															
1	D															
0	F															

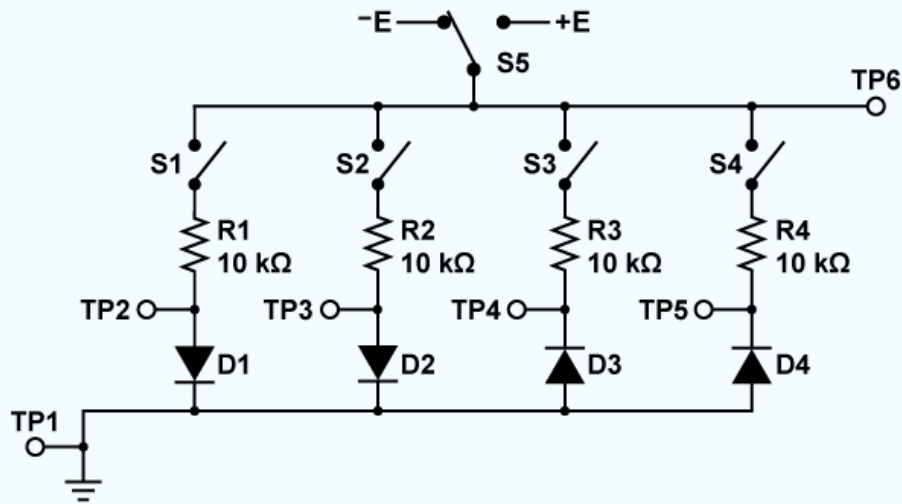
<p>4. Maintain effective verbal and nonverbal communication with health care providers, patients/clients, caregivers and the general public.</p>	<p>4. To introduce students to the importance of effective communication, BET 240 requires the student to interact with other healthcare givers, patients, and the general public in a professional manner.</p>	<p>4. Students participating in the concentration cohort of the BMET option (as a whole) will earn a <u>Clinical On-Site Study Communication, Professionalism and Teamwork Performance Class Average Score</u> of at least (2) in BET 240.</p>	<p>4. Scale Used</p> <table border="1" data-bbox="1262 228 1465 643"> <thead> <tr> <th>Points</th> <th>Grade</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>A</td> </tr> <tr> <td>3</td> <td>B</td> </tr> <tr> <td>2</td> <td>C</td> </tr> <tr> <td>1</td> <td>D</td> </tr> <tr> <td>0</td> <td>F</td> </tr> </tbody> </table> <p>Class Average Goal 2 Points or Higher</p> <p>Class Average – 2.5</p>	Points	Grade	4	A	3	B	2	C	1	D	0	F	<p>The program will use the results of this assessment as a gauge. Results above the midway point indicates that our methods of educational information delivery were successful. <u>The 3.8 Class Average</u> shown in the rubric indicates that students performed at a very high level with regards to <u>communication and professionalism</u>.</p> <p>An aspect of this is covered in BET 234 with the Vital Maintenance assignment.</p>
Points	Grade															
4	A															
3	B															
2	C															
1	D															
0	F															
			<p>Submitted by: <i>Eric Carwell</i></p>													

SLO 1: Evidence

4030

V1.3.1

Pick up the PC-22A card. The purpose of this card is to demonstrate the operation of junction diodes.



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SLO 2: Evidence

[Return to SLO 1](#)
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[Return to SLO 3](#)
[Return to SLO 4](#)

2. The student exhibited a mature professionalism in their work habits: promptness, diligence, thoroughness of work output, ethical decision-making, courteousness, and appearance.

1-Unacceptable	2-Poor	3-Acceptable	4-Strong	5-Exemplary
				X

3. The student demonstrated a practiced knowledge of effective customer service and teamwork.

1-Unacceptable	2-Poor	3-Acceptable	4-Strong	5-Exemplary
				X

Comments:

Please comment on any area that you feel the extern has performed well, needs Improvement, etc...

██████████ has volunteered at the VAMC Birmingham HTM Service completing over 120 hrs of volunteer work as an intern Biomedical Equipment Support Specialist. ██████ has worked very well with our Biomed team, displaying both ability and maturity during this training period. Provided hands on troubleshooting, performed preventive maintenance, calibrations, and repairs on Alaris pumps, Welch Allyn monitors, Surgical Equipment and Hill Rom Beds. He has very professional customer service skills and is well organized. He reported on time always ready to work with a cheerful attitude. ██████ will be an asset to any Biomed/HTM Service.,

SLO 3: Evidence

Pencil Whipping, Oh the Possibilities

3

Pencil whipping, what does that mean? Can you get in trouble for it and are there legal ramifications? How can one avoid being charged with it? In this paper, I will discuss these answers and more. There will be examples of actual court cases in which medical professionals were charged and or accused of falsifying documents. As well as examples of fraud in the biomedical field. But first, let me explain what the term "pencil whipping" means.

The term pencil whipping is legally known as falsifying documentation. Falsifying documentation, in the medical field, is a criminal offense that involves the altering, changing, modifying, passing or possessing of a document for an unlawful purpose. Altering a document to change labs and or test results for a patient or equipment. An example of this would be if one were to sign off on a piece of equipment as being serviced and calibrated without actually doing the calibration or service. There are several different forms of pencil whipping found in the medical field, done for several various reasons.

The first reason given for document fraud is for one to cover up a mistake made, in regard to patient care. In one particular case back in January of 2013, before a Baltimore circuit court, it was found that, a surgeon had changed the patient's medical records to state that the patient had complained of right-sided pelvic pain. In this particular case the surgeon removed the wrong ovary from the patient and did not disclose to her that this was done. Furthermore, the surgeon left the ovary in the patient that had a mass on it potentially causing further harm to the patient. The patient was only made aware of this discrepancy at one of her follow up appointments, giving her strong grounds for a lawsuit against the surgeon and any parties involved.

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SLO 4: Evidence

BET234 Biomedical Electronic Systems III
 Vital Signs Monitor
 Lab 3 Performance Record

ADC Vital Signs Monitor

Model Number: Adview 2 (M260)

Serial Number: M00072253

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Advanced Performance Configuration

Task To Be Performed	Complete
Change the password for the "Medical" & "Service" mode to: JSBMET17	<input type="checkbox"/>
Change the date and time to the current date and time	<input type="checkbox"/>
Enable Pulse Rate from SPO2 module	<input type="checkbox"/>
Change Display Timeout to: (AC) 600 sec	<input type="checkbox"/>
Auto Shut Down Timeout to: (Bat) 1800 sec	<input type="checkbox"/>
Save Current Measurement Before Shutdown Timeout (Both AC & Battery)	<input type="checkbox"/>
Perform NIBP calibration using Pronk Sim Cube Manometer	<input checked="" type="checkbox"/>
Verify NIBP calibration by simulating blood pressure via Pronk Sim Cube	<input checked="" type="checkbox"/>
Verify SPO2 Accuracy by simulating SPO2 via Pronk OxSim SC-5	<input checked="" type="checkbox"/>
Reset settings to default settings (after instructor verification).	<input type="checkbox"/>
	<input type="checkbox"/>

NIBP Performance Test

NIBP Setting (Adult)	NIBP Measured	Monitor Specs	Pass	Fail
Adult 120/80	116/84	+/- 5mmHg	<input checked="" type="checkbox"/>	<input type="checkbox"/>
High 190/120	198/129	+/- 5mmHg	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Low 80/40	75/47	+/- 5mmHg	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NIBP Setting (Pediatric)	NIBP Measured	Monitor Specs	Pass	Fail
Neo 70/40		+/- 5mmHg	<input type="checkbox"/>	<input type="checkbox"/>

SPO2 Test

SPO2 Selected	SPO2 Measured	Monitor Specs	Pass	Fail
85% - 80 BPM	84%/80	+/- 2% & +/- 3BPM	<input checked="" type="checkbox"/>	<input type="checkbox"/>
98% - 80 BPM	97%/80	+/- 2% & +/- 3BPM	<input checked="" type="checkbox"/>	<input type="checkbox"/>
99% - 140 BPM	100%/ 140	+/- 2% & +/- 3BPM	<input checked="" type="checkbox"/>	<input type="checkbox"/>