

جامعة البلقاء التطبيقية

وحدة التقييم والامتحانات العامة

مصفوفة الكفايات والمهارات العملية لمخرجات التعلم Learning Outcomes

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| الورقة           | الرابعة (امتحان الكفاءة العملي)     |
| البرنامج/ المسار | تكنولوجيا الهندسة الالكترونية       |
| التخصص           | تكنولوجيا الاجهزة الطبية (٠٢٠٤٠٦٤٠) |

| Learning Outcomes |                                  |  |
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| No.               | Learning Outcome                 | Specialized Skills   |
| 1-                | The basic of electrical circuits | <ol style="list-style-type: none"><li>1. Knowing the operation of the lab equipment:<ol style="list-style-type: none"><li>a. oscilloscope, function generator, DMM and breadboard.</li></ol></li><li>2. Measurement the electrical resistance using DMM.</li><li>3. Measurement the capacitance using DMM.</li><li>4. Measurement electrical voltage and current to verify KVL and KCL in DC circuit.</li><li>5. To be familiar with an AC oscilloscope measurement:<ol style="list-style-type: none"><li>a. Identifying the amplitude of Ac signal.</li><li>b. Identifying the frequency of Ac signal.</li><li>c. Identifying the period of Ac signal.</li></ol></li></ol>  |
| 2-                | Basic of electronic devices      | <ol style="list-style-type: none"><li>1. Test electronic devices using DMM (diode, Zener diode, BJT).</li><li>2. Construct electronic circuits:<ol style="list-style-type: none"><li>a. Construct half wave and full wave bridge rectifier circuit, and measuring input and output signals using oscilloscope.</li><li>b. Construct Common- emitter and common- collector circuit, and measuring terminals voltage and current using DMM.</li></ol></li><li>3. Construct electronic circuit using operation amplifiers and measuring the input and output signal using oscilloscope:<ol style="list-style-type: none"><li>a. Inverting amplifiers circuit.</li><li>b. Inverting Summing Amplifier</li><li>c. Non-inverting amplifiers circuit.</li><li>d. Differential amplifiers.</li></ol></li></ol> |



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|    |                        | <p>e. Comparators amplifiers circuit.</p> <p>f. Active filters circuits (Low pass, high pass, band pass filter circuits).</p>  |
| 3- | <b>Medical devices</b> | <p><b>a) ECG device:</b></p> <ul style="list-style-type: none"> <li>○ Identify the main parts of ECG device and their function.</li> <li>○ Identifying the major malfunctions that occur in ECG device.</li> </ul> <p><b>b) Defibrillator:</b></p> <ul style="list-style-type: none"> <li>○ Identify the main parts of the defibrillator and their function.</li> <li>○ Identify the operation modes of the defibrillator (manual, automatic &amp; synchronies).</li> <li>○ Identifying the major malfunctions that occur in Defibrillator.</li> </ul> <p><b>c) Operation table:</b></p> <ul style="list-style-type: none"> <li>○ Identify the main parts of the operation table and their function.</li> <li>○ Identify the major malfunctions that occur in the operation table.</li> </ul> <p><b>d) Operation lamp:</b></p> <ul style="list-style-type: none"> <li>○ Identify the main parts of operation lamp and their function.</li> <li>○ Identifying the major malfunctions that occur in the operation lamp.</li> </ul> <p><b>e) Electrosurgical unit:</b></p> <ul style="list-style-type: none"> <li>○ Identify the main parts of electrosurgical unit and their function.</li> <li>○ Identifying the major malfunctions that occur in the electrosurgical unit.</li> </ul> <p><b>f) Infant incubator:</b></p> <ul style="list-style-type: none"> <li>○ Identify the main parts of the infant incubator and their function.</li> <li>○ Identifying the operation modes of the infant incubator.</li> <li>○ Identifying the major malfunctions that occur in the infant incubator.</li> </ul> <p><b>g) Ventilator:</b></p> <ul style="list-style-type: none"> <li>○ Identify the main parts of the ventilator and their function.</li> <li>○ Understanding the pre-installation requirements for the ventilator.</li> <li>○ Identifying the major malfunctions that occur in the ventilator.</li> </ul> <p><b>h) Anesthesia:</b></p> <ul style="list-style-type: none"> <li>○ Identify the main parts of anesthesia and their function.</li> <li>○ Understanding the pre-installation requirements for the anesthesia.</li> <li>○ Identifying the major malfunctions that occur in the anesthesia.</li> </ul> |



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|  |  | <p><b>i) X-Ray Machine:</b></p> <ul style="list-style-type: none"><li>○ Identify the main parts of the X-Ray machine and their function.</li><li>○ Identifying the major malfunctions that occur in the X-Ray machine.</li></ul> <p><b>j) Ultrasound Machine:</b></p> <ul style="list-style-type: none"><li>○ Identify the main parts of the Ultrasound machine and their function.</li><li>○ Identifying the major malfunctions that occur in the Ultrasound machine.</li></ul> |
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