جامعة البلقاء التطبيقية

وحدة التقييم والامتحانات العامة

مصفوفة الكفايات والمهارات العملية لمخرجات التعلم Learning Outcomes

الورقة	الثالثة (المهارات الفنية المتخصصة)
البرنامج/ المسار	تكنولوجيا الهندسة الالكترونية
التخصص	تكنولوجيا الاجهزة الطبية (٠٢٠٤٠٦٣٠)

Learning Outcomes		
No.	**Learning Outcome**	**Specialized Skills**
1-	**Medical devices**	1. Understanding the basic of ECG device: a. Understanding the ECG front-end circuit. b. Understanding the configuration and role of RLD-circuit. 2. Understanding the basic of the endoscopy system: a. Knowing the classification of scopes (rigid & flexible scopes). b. Understanding the main parts of flexible scope and their functions. 3. Understanding the basic of electrosurgical unit: a. Determine the main parts of ESU and their functions. b. Understanding the principle of operation of ESU. c. Differentiate between monopolar mode and bipolar mode. d. Understanding the operation mode of ESU in medical filed (cut, coagulation & fulguration). 4. Understanding the basic of infant incubator: a. The function of the infant incubator. b. The main parts of the infant incubator and their functions. c. The operation modes of the infant incubator. 5. Understanding the basic of the of ventilator: a. The function of the ventilator. b. The types of the ventilator. c. The main parts of the ventilator. d. The operation of the ventilator. e. The pre-installation requirements for the ventilator. 6. Understanding the basic of the defibrillator: a. The function of the defibrillator.

		b. The types of the defibrillator (monophasic & biphasic). c. The operation modes of the defibrillator (manual, automatic & synchronies). 7. Understanding the basic of the anesthesia: a. The function of the anesthesia. b. The main parts of the anesthesia. c. The principle of the operation of anesthesia. d. The pre-installation requirements for the anesthesia. 8. Understanding the basic of the hemodialysis: a. The function of the hemodialysis. b. The main parts of the hemodialysis. c. The principle of operation of the hemodialysis. d. The pre-installation requirements for the hemodialysis. 9. Sterilization System a. Categories sterilization equipment according to the main principle of operation (Steam, Gas and Plasma Sterilization). b. Identify the medical application for each type of sterilization mechanism. c. Steam Sterilization: • Understanding the main principle of operation. • Understanding sterilization cycle. • Determine the main parts of sterilizer and their function.
2-	**Medical Imaging Systems**	1. Categorize the imaging equipment based on the principle of operation (X-ray, Ultrasound). 2. X-Ray: a. Understanding the physics and the production of X-ray. b. Determine the main parts of X-ray system and their functions. c. Application of X-Ray in medical diagnosis. d. Differentiate between digital and analog radiography. 3. Ultrasound: a. Understanding the physic of Ultrasound waves. b. Determine the main parts of Ultrasound system and their functions. c. Application of ultrasound in medical diagnosis. d. Differentiate between scanning modes of ultrasound (A-mode, B-mode, M-mode and Echo-mode).

3-	**Basic of Electrical Circuit**	1. Understanding the basic electrical quantities (resistance, current, voltage, and power)، and their relationships (ohm's law). 2. Analysis resistors in series. 3. Analysis resistors in parallel. 4. Analysis DC circuit using KVL and KCL.
4-	**Basic of Electronics Circuit**	1. Recognizes p and n type materials and explains characteristics of these materials. 2. Understanding the basic structure, operation, and equivalent circuit of a diode. 3. Knowing BJT basic structure and operation. 4. Recognizes half-wave and full-waverectifier circuits and explains the operation of these circuits. 5. Analyzes and performs measurements in different amplifier circuits: a. Inverting amplifiers circuit. b. Inverting summing amplifier circuit. c. Non-inverting amplifiers circuit. d. Differential amplifiers. e. Instrumentation amplifiers circuit. f. Active filters circuits (Low pass, high pass, and band pass filter circuits).