جامعة البلقاء التطبيقية

وحدة التقييم والامتحانات العامة

مصفوفة الكفايات والمهارات العملية لمخرجات التعلم Outcomes Learning

الورقة	الرابعة (المهارات الفنية المتخصصة)
البرنامج / المسار	العلوم التطبيقية
التخصص	تقنيات المواد الخطرة
رمز الورقة	**023001M/4**

No.	مخرجات التعلم	المهارات الفنية المتخصصة
1	**Types of hazardous materials and how to handle them**	**1. The student's ability to classify hazardous materials and include them in the nine groups of the United Nations classification of hazardous materials, including:** - Explosives. - Flammable gases. - Flammable liquids. - Flammable solids. - Oxidizers and peroxides. - Toxic and infectious materials. - Radioactive materials. - Corrosive materials. - Other various environmental hazards. **2. The ability to identify hazardous materials using information gathering tools for hazardous materials, including the ERG (Emergency Response Guide for Hazardous Materials) manual. The student should be able to:**

		- Identify the hazardous material, its characteristics, and how to handle it if given only the name of the material. - Identify the hazardous material, its characteristics, and how to handle it if given only the UN number. - Identify the chemical and physical properties of hazardous materials and how to handle them. **3. Familiarity with signage and NFBA 704, enabling the student to:** - Identify the health effects of a hazardous material. - Identify its potential for combustion or ignition. - Identify its reactivity to the hazardous material. -Identify any hazards specific to the hazardous material.
2	**Methods of preventing hazardous materials**	**First: Incident Site Conditions** • Determine the circumstances under which the incident occurred in terms of: 1. **Weather conditions**. 2. **Topography** of the incident location. 3. **Quantity of the hazardous material** involved. 4. **Type of container or vessel** transporting the hazardous material. **Second: Classification and Characteristics of the Hazardous Material** • Identify and classify the hazardous material being handled, its level of danger, and its effects on the human body and surrounding environment through: 1. **ERG Guidebook** (Emergency Response Guidebook for hazardous materials). 2. **Observable symptoms, signs, and characteristics** of the hazardous material reported at the scene, including: o Symptoms shown by the affected individuals. o Color of the chemical vapor or cloud, if present.

		○ Means of dispersion, if any, and the **type of spill or release** ### Third: Measures Required to Prevent Exposure to the Hazardous Material • A complete understanding of how to take necessary precautions to avoid exposure to the hazardous material by identifying the following: 1. **Routes of entry** of the hazardous substance into the body: ○ Inhalation and breathing. ○ Ingestion. ○ Skin absorption or injection. ○ Eye contact. 2. **Short- and long-term effects** of exposure to the hazardous material by referencing occupational exposure values such as: ○ **Short-Term Exposure Limit (STEL) –** over a 15-minute period. ○ **Time-Weighted Average (TWA)** – over an 8-hour workday. ### Fourth: Identification of Required Personal Protective Equipment (PPE) • Determine the protective and containment equipment necessary to handle and control the hazardous material and prevent its spread, including: ○ Breathing apparatus. ○ Protective masks. ○ Various types of protective suits. ○ Detection, monitoring, and analysis devices. ○ Incident response equipment. Various containment and control tools.
3	**Types of Hazards Resulting from Hazardous Materials**	**When Dealing with Hazards Resulting from Hazardous Materials, the Student Should Be Able to:** ### First: Chemical Hazards • The student should be able, in the event of a hazardous chemical incident or the use of chemical weapons of mass destruction (WMDs), to perform the following:

		○ Classify the hazardous chemical substance. ○ Identify the **chemical and physical properties** of the hazardous material. ○ Recognize the **signs and symptoms** indicating exposure to a chemical incident or chemical WMD. ○ Determine the **chemical risks** associated with the hazardous substance. ○ Apply **protective measures** when dealing with chemical incidents. ○ Implement the correct **response procedures** for hazardous chemical material incidents or chemical WMD events. Second: Biological Hazards • The student should be able, in the event of a biological agent incident or the use of biological weapons of mass destruction, to perform the following: ○ Classify the **biological hazardous material** (viruses, bacteria, fungi, or toxins). ○ Identify the **characteristics** of the biological hazardous material. ○ Recognize the **signs and symptoms** of exposure to a biological release or biological WMD event. ○ Determine the **risks associated with biological agents**. ○ Apply **preventive measures** when dealing with biological agents. ○ Implement the appropriate **response procedures** for biological release incidents or biological WMD events. Third: Radiological Hazards • The student should be able, in the event of a radiological material release or the use of radiological weapons of mass destruction, to perform the following:

		○ Classify the **radiological hazardous material**. ○ Identify the **properties** of the radiological hazardous material. ○ Recognize the **signs and symptoms** indicating exposure to a radiological release or radiological WMD incident. ○ Determine the **risks associated with radiological agents**. ○ Apply **protective measures** when dealing with radiological sources. Implement the proper **response procedures** for radiological release incidents or radiological WMD events.

4	**Methods of Handling Hazardous Materials Incidents, including "Detection, Treatment, Decontamination, Containment, Storage, and Transportation."**	The Student Should Be Practically Able to Perform the Following: First: Gathering Information About the Incident This procedure includes identifying the hazardous material **before arriving at the incident site**, and involves: Notification and reporting information. Observed symptoms and signs. Nature of the incident. Location and topography of the site. Weather conditions. Chemical and physical properties of the material. Second: Preparing Materials, Equipment, and Devices This procedure covers the materials, tools, and equipment that must be available for use during the incident, including: Personal Protective Equipment (PPE). Detection and analysis instruments depending on the incident type. Incident response equipment. Rescue tools and first aid supplies. Decontamination equipment for personnel, responders, the site, and vehicles.

		Containment, transportation, and storage equipment for the hazardous material. ### Third: Arrival at the Incident Site This procedure requires full awareness and understanding of the following: Proper positioning and staging of response vehicles. Establishing and marking the site perimeter (scene cordoning). Identifying the **Incident Command Post (ICP)** location. Defining and dividing the **hazard zones** into three areas: *Hot Zone, Warm Zone, and Cold Zone.* Determining the location for setting up **decontamination tents**. Identifying **safe refuge points** within the hazardous area. Establishing **entry and exit routes**. Determining **ambulance staging areas**. Placing **support equipment** in designated areas, including entry/exit signs, wind direction indicators, and traffic cones. ### Fourth: Incident Response • This procedure includes developing a **comprehensive action plan** for managing the incident, which involves the following: ○ Preparing a summary of the **type of incident** and the **hazardous material** involved. ○ Dividing responsibilities and assigning tasks to the response teams, including:

		1. **Reconnaissance and Detection Team** 2. **Rescue Team** 3. **Decontamination Team** 4. **Medical Team** 5. **Response and Sampling Team** 6. **Scientific Team (Mobile Laboratory)** 7. **Incident Command Team** ○ Identifying the materials, equipment, and devices required for incident response and mitigation. ○ Developing the plan for the reconnaissance and detection team, including post-entry reporting. ○ Preparing the response team's operational plan and readiness for deployment. ○ Sending collected samples to the mobile laboratory if the substance is unknown. ○ Defining the objectives of the rescue team and ensuring full readiness before entry. ○ Specifying the tasks of the decontamination team. ○ Conducting medical screening of responders before entry, monitoring them during operations, and checking them after exiting the site. ○ Ensuring full coordination among all teams through the Incident Command System (ICS). ○ Defining the responsibilities of the containment sub-team under the decontamination unit. Fifth: Incident Termination and Restoration of Readiness This procedure includes the tasks required from all incident responders and involves: Preparing a **post-incident summary report**, identifying **strengths** and **opportunities for improvement** observed during the response.

		Gathering **feedback** to enhance performance in future incidents. Collecting, inspecting, decontaminating, and restoring all equipment to operational readiness. **Handover of the site** to the relevant authorities or specialized agencies. Returning to the **base of operations** and restoring normal readiness status.