

Undergraduate Diploma in Occupational Health and Safety Intake October 2025

Assessment Task: One written assignment based on chosen questions	
Module: <i>Managing Chemical Biological and Psychological Risks</i>	Tuition Centre: 21 Academy Licence Number: 2018-017
Level: MQF Level 5	Student Name:
Date:	ID Number:
Assignment Deadline: 2 July 2026	
<p>Task</p> <p>This assignment aims to assess your understanding of Managing Chemical Biological and Psychological Risks and your ability to apply effective risk control measures. Through the questions provided, you will analyse common Managing Chemical Biological and Psychological Risks and demonstrate your knowledge of health and safety regulations.</p> <p><i>You should plan to spend approximately 30 hours researching the assignment question, preparing for, and writing the assignment for assessment. The nominal word count for the assignment is 2,400 words.</i></p> <p><i>Please ensure that you refer to 21 Academy's Assignment Guidelines for comprehensive information regarding the submission of your assignment. Additionally, the assignment submission form must be included with your completed work, clearly indicating which question you have chosen to answer by ticking the box next to the question number.</i></p>	
<p>Answer 1 (one) question from the following:</p> <div style="margin-bottom: 10px;"> ☐ Question 1: Xummiemu Care Hospital Laundry Services </div> <p>Xummiemu Care operates a high-volume laundry service processing clinical linens for local hospitals, including infectious disease wards. The facility employs 55 workers in a hot, humid, and poorly ventilated environment.</p> <ul style="list-style-type: none"> • Biological Incidents: Workers manually sort heavily soiled linens contaminated with blood, body fluids, and potentially airborne pathogens. They are provided only with basic aprons and household rubber gloves, with no eye protection. Aerosols are visibly generated when workers vigorously shake out linens and load the industrial washing machines. Recently, a worker was splashed in the face with contaminated wastewater during a machine malfunction. The worker merely rinsed their face with water, did not report the incident, and later developed severe flu-like symptoms. Another worker contracted a confirmed Hepatitis B infection last year. There is no vaccination program, no health surveillance, and waste bins are constantly overflowing with contaminated material. • Chemical Incidents: To combat stubborn stains, workers frequently mix unlabelled cleaning chemicals. A common practice is combining bulk bleach with ammonia-based surface cleaners, which inadvertently creates highly toxic chloramine gas. There is no Chemical Register, no risk assessments have been conducted, and workers have received zero formal training on chemical incompatibilities. <p>Critically evaluate the hazards present at Xummiemu Care and formulate a comprehensive, systemic safety overhaul. Your response must address the following advanced criteria:</p> <ol style="list-style-type: none"> 1. Aerosolization Mechanics and Biological Risk Profiling: Analyse the mechanics of how aerosols are generated in this specific workplace and describe the exact routes of exposure for the workers. Classify the biological agents likely present (e.g., Hepatitis B, respiratory viruses) using Risk Groups 1-4, justifying your classification based on pathogenicity and available treatments. (20%) 	

2. **SDS Implementation & Emergency Protocols:** Moving beyond basic first aid, design a comprehensive emergency response protocol for both a biological fluid splash and a toxic gas release. You must explicitly reference how you would utilize Sections 4 (First Aid), 6 (Accidental Release), and 7 (Handling and Storage) of a Safety Data Sheet (SDS) to establish these new, safe working procedures . (40%)
3. **Health Surveillance Strategy:** Propose a mandatory health surveillance and vaccination strategy for the facility. Justify why this is legally and medically necessary for these specific workers . (40%)



Question 2:

Vulcan Marine refurbishes commercial vessels and yachts. The yard operates 24/7 with 36 full-time technicians split across two specialised operational zones. The facility lacks a centralized chemical register, and safety data sheets (SDSs) are locked in a supervisor's office terminal.

Zone 1: Blackwater & Marine Sanitation Servicing Unit Thirty utility workers drain, flush, and service shipboard blackwater (sewage) holding tanks and greywater filtration systems. Technicians manually couple high-pressure hoses, frequently clearing blockages by shaking and back-flushing lines. This process generates heavy, visible wastewater mist and bio-aerosols in an enclosed, humid service dock with no mechanical extraction. Workers are issued standard canvas overalls and household rubber gloves; no respiratory protection equipment (RPE) or unvented eye protection is provided.

Recently, an operator sustained a high-pressure splash of raw sewage directly into their eyes and mouth during a coupling failure. The worker rinsed their face with tap water but omitted a formal incident report. Within 48 hours, they developed acute gastrointestinal distress, high fever, and a severe respiratory infection. Separately, a long-term technician was clinically diagnosed with Hepatitis B last year. The unit has no biohazard signage, biological spill kits, or employee immunization protocols.

Zone 2: Hull Stripping & Anti-Fouling Coating Bay 6 technicians strip old marine coatings using organic solvent mixtures (containing Chloroform and Hexane) and spray-apply isocyanate-based polyurethane anti-fouling lacquers. Spraying occurs inside an enclosed drive-in booth. The booth's local exhaust ventilation (LEV) system was installed 9 years ago and has never undergone structural certification. Technicians utilise thin, disposable latex examination gloves during manual solvent-wiping tasks.

The six painters experience recurring cycles of dry coughing, chest tightness, and expiratory wheezing that peak on Thursday afternoons but clear up during weekend absences. The solvent handlers report chronic afternoon headaches, dizziness, and peripheral numbness in their fingertips. The latex gloves provided routinely soften, swell, and tear within minutes of exposure to the solvent mixtures. Following worker complaints about intense chemical odours, management mounted a single static air-monitoring sampler on a support beam 15 meters away from the spray booth, near the open bay doors. The monitoring report indicated airborne concentrations were below statutory Workplace Exposure Limits (WELs); consequently, management dismissed all health complaints.

1.

Critically analyse the biological risk profile and exposure pathways within the Zone 1 blackwater unit, explaining the specific transmission mechanics behind both the acute and chronic medical conditions reported, and evaluate the systemic organizational failures that caused the critical incident to go unreported. (25%)

2.

Provide a comprehensive technical and toxicological critique of Zone 2, analysing the specific physiological mechanisms driving the workers' respiratory and neurological symptoms, the chemical degradation of the provided personal protective equipment, and the scientific flaws in management's localised exhaust ventilation maintenance and air-monitoring methodology. (25%)

3.

Develop an action plan to fix the safety management failures across both zones, explaining how you will apply the hierarchy of controls and transform the company's safety culture. (50%)



Question 3:

Explain how organisations can manage psychosocial risks and improve employee wellbeing.

Pass Mark of total weighted score, including Presentation and Self-Assessment - 50%

Assignment weighted score 60%

By submitting I confirm that this assessment is my own work

Mark:

Signature: <main assessor>

Date

Signature: <quality assurance>