

Assignment 03 (Individual) – GAMES DEVELOPMENT

SE4031 – Games Development

Title – *Immersive VR Simulation Experience: VIRTUAL EMERGENCY RESPONSE*

Assignment Created By: Mr. Aruna Ishara Gamage, Mr. Nushkan Nismi

End Digit 4

Assignment Weight: **30%**

OBJECTIVE

Virtual Emergency Response

Design and develop an immersive Virtual Reality (VR) emergency response simulation using Unity, where the player must respond to critical and time-sensitive scenarios.

Players navigate emergency environments, interact with rescue equipment, issue voice-based emergency commands, and make decisions under pressure to successfully complete a time-critical emergency challenge.

ASSIGNMENT STRUCTURE (2 Parts)

• **Part A (60%) – Based on Tutorials + Lab Sheets**

Students can score Part A using concepts and techniques covered in tutorials and lab sessions.

• **Part B (40%) – Self-Learning + Advanced Work (Required for High Grades)**

Part B requires independent research and creativity, focusing on voice-based ritual invocation and a unique sanctuary challenge.

CORE REQUIREMENTS

Part A Requirements (60%)

1. VR Movement & Locomotion

- Use **teleportation** or **joystick-based** movement.
- Allow **safe and comfortable** navigation across emergency environments (rooms, zones, outdoor areas)

2. Emergency Interactable

- Implement at least **three (3)** of the following:
 - **Emergency equipment:** Extinguishers, medical kits, or tools)
 - **Victims / NPCs:** Characters requiring assistance
 - **Switches, breakers, panels:** Control systems or power
 - **Doors or access barriers:** Open or restrict access

3. VR UI Elements

- Include a HUD or VR-friendly UI displaying:
 - Emergency priorities or task list
 - **Warnings and alerts**
 - Timers or condition indicators

4. Basic Environmental Feedback

- Alarm sounds, hazard indicators, or urgency cues
- Environmental responses to player actions

Part B Requirements (40%) – Self Learning

5. Ritual Invocation System (Voice Input Only)

- The player must trigger at least **three (3)** emergency actions using voice commands only.

Example Commands (DO NOT USE):

- “**Apply CPR**” – Stabilizes a patient
- “**Extinguish Fire**” – Suppresses a hazard
- “**Call Backup**” – Summons assistance

IMPORTANT NOTE

- The ritual names listed below are **EXAMPLES ONLY**
- Students **MUST** create their **own original emergency command** phrases
- Using the example words exactly as written will result in **0 marks** for this component.

The system must:

- Accurately detect commands using voice input tools (e.g., Windows Speech API (wit.ai)).
- Provide visual/audio feedback upon successful commands recognition.
- Show a response or warning for unrecognized commands.
- When the application is built and executed directly on a VR headset, the Windows Speech API will not function. However, the same voice command system will work correctly when the application is built as a Windows Desktop (.exe) and run on a PC with a connected VR headset.

6. Voice Command Integration

- Integrate a **real-time** speech recognition system.
- Provide **visual** and/or **audio** feedback for:
 - **Correct** emergency commands
 - **Incorrect** or **unrecognized** commands
- **Voice recognition** must remain responsive during gameplay

7. Dynamic Scenario Reaction System

- **Emergency** commands and decisions **must trigger** clear scenario-based reactions, such as:
 - Fire spreading or being suppressed
 - Changes in victim condition
 - Escalation or resolution of hazards

8. Emergency Challenge Area (Mandatory)

- **Include** a dedicated emergency response scenario where the player must:
 - Use voice commands under time pressure
 - Combine equipment interaction + decision-making
 - Successfully complete a time-critical rescue or stabilization challenge

Part B Creative Challenge Note

Part B includes a creative challenge, and it must be unique (**not copied from other students**) to score marks.

Folder Structure & Code

- Unity project must follow the folder structure.
- Scripts and assets must be well-named and organized.

Game Documentation

- Submit a PDF with:
 - Title, student name, and IT number
 - Game summary and spell list
 - Screenshots of gameplay
 - Control guide (movement, voice usage)
 - Credits for any assets/tools used

Submission Requirements

- **Windows .exe Build**

Include .exe and Data folder, playable with a VR headset.

- **Zipped Unity Project Folder**

Must follow the folder structure.

Upload to a shared Google Drive folder in Courseweb.

- **Gameplay Demo Video**

- 5 minutes showcasing:

- Voice-activated spellcasting
 - Movement
 - Item collection and target interaction
 - Spellbook interaction
 - Challenge zone gameplay

PLAGIARISM / ORIGINALITY VERIFICATION (VIVA)

- A mandatory one-to-one viva will be conducted
 - Students must clearly explain:
 - Voice command logic
 - System interaction behavior
 - Emergency challenge design
- Failure to justify originality may result in mark deductions or zero marks

Assessment Rubric (Part A + Part B)

Part A (60 Marks)

Criteria	Excellent	Good	Satisfactory	Poor	Marks
VR Movement & Locomotion	Smooth, immersive, and comfortable navigation across emergency environments	Navigation implemented with minor comfort or control issues	Basic navigation with noticeable limitations	No or broken navigation	12
Emergency Interactables	All required interactables fully implemented with clear visual/audio feedback and logical responses	Most interactables working with minor issues	Limited or partially functional interactables	No meaningful interactables	12
VR UI Elements	Clear, VR-friendly HUD showing priorities, alerts, and timers	UI mostly clear with minor usability issues	Basic UI with limited usefulness	No VR UI elements	10
Folder Structure & Code Quality	Fully structured Unity project with clean, well-named scripts and assets	Mostly structured with few misplacements	Inconsistent structure	Disorganized or missing structure	8
Game Documentation	Complete, clear PDF covering all required sections	Mostly complete with minor missing details	Basic documentation with limited explanation	No documentation submitted	8
Part A Total					60

Part B (40 Marks) – Self Learning

Criteria	Excellent (Full Marks)	Good	Satisfactory	Poor	Marks
Voice-Based Emergency Commands (Voice Only)	Three (3) unique emergency commands accurately triggered via voice with clear VFX/SFX	Two commands working, one partially functional	Only one unstable or partially working command	Commands missing or not voice-controlled	20
Voice Command Integration	Voice system is stable, responsive, and provides clear feedback with captions	Minor delays or recognition issues	Frequently unresponsive or inconsistent	Not implemented or unusable	12
Dynamic Scenario Reaction + Emergency Challenge Area	Strong immersion with dynamic scenario reactions and a fully playable time-critical emergency challenge	Working challenge with minor functional issues	Weak reactions with a basic or low-pressure challenge	Poor or missing reactions and challenge	8
Part B Total					40

Plagiarism / Originality Verification (Viva)