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| AI IN robotics  Coursework 1 | Group Members:  Module Tutor:  Submission Date: |

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# Introduction

# Mission and Task

Mission & Tasks: A concise description of what the

robot must accomplish and a task list (e.g., patrol → detect target category → decide action → navigate to item → report/organize).

# Skills Required

Required Skills (with interfaces): What the robot needs to be able to do (perception, localization,

planning, optional manipulation/HRI). For each skill, describe inputs/outputs and success criteria.

# Hardware Components

Hardware Components (with alternatives): Sensors (RGB camera, depth camera/OAK-D, 2D LiDAR, IMU, AprilTags) and actuators/computing (Raspberry Pi/NUC). Provide alternatives for each component and justify choices (accuracy, cost, compute, integration complexity).

# Software Architecture

Software Architecture: A block diagram showing the main modules (e.g., detection, depth-to-3D, mapping, navigation), data flows, and (if known) ROS 2 topics/actions/frames you’d use in the second half of the module.

# Dataset and Model Plan

Dataset & Model Plan: What classes you will recognize, how you will collect/label data, how you will evaluate (accuracy, F1, confusion matrix, or mAP if you consider detection later).

# Risk and Safety

Risk & Safety: E-stop, speed caps, minimum obstacle distance, fallback when detection/localization fails.

# Budget

Budget / BOM: A realistic bill of materials with indicative prices and a target budget

# References

References & Contributions: Cite relevant sources; include a short contributions

section for each group member (if it is a team work)

# Contributions

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| --- | --- | --- | --- |
| Student Name | Student Number | Contribution To Project | Signature |
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