

STUDENT FEEDBACK FORM: MICHAEL JONES

Generic Assessment Criteria	Mark s ava ila ble	Mar ks awar ded
1. Engagement with Literature Skills: Show you have researched and used reliable sources to support your ideas. Include key theories and up-to-date information about mechanical dynamics, control systems, and software like MATLAB Simulink with proper referencing (Harvard style).		
Feedback: You include a small number of appropriate academic sources (e.g. Isbell and Jaffe, 2013; Sunquist, 2002) alongside some relevant datasheets, which shows an initial attempt to ground your work in literature. However, the overall reference base is still dominated by product pages and general websites. As a result, there is limited evidence of engagement with core literature in areas such as dynamics and control, sensor reliability and false triggering, habituation and adaptation in wildlife deterrence, and low-power embedded system design. Referencing is also inconsistent. Many sources are not correctly formatted in Harvard style, and several items appear in the reference list without being properly cited in-text. This weakens the academic reliability of the report, as it is not always clear where evidence is being applied to support technical claims. Feedforward: To improve, include a short but focused literature review that covers key technical areas relevant to your system. This should include PID or basic control approaches for simple mechatronic systems, sensor reliability and false trigger behaviour, habituation effects in wildlife deterrence, and fundamental principles of off-grid solar sizing and energy budgeting. You should also replace bare URLs and product links with properly formatted Harvard references, including author or organisation, year, title, publisher or site, URL, and access date. Finally, ensure that every item in your reference list is explicitly cited in the main text. This will significantly improve the academic strength, traceability, and credibility of your work.	15	3
2. Knowledge and Understanding Skills: Demonstrate that you understand the main concepts and principles behind your project, explaining how they relate to designing the monkey deterrent system and its challenges.		
Feedback: You demonstrate a sound understanding of the scenario constraints, including off-grid operation, low cost, and the requirement for a non-harmful deterrence strategy. The proposed sensing and actuation concept is coherent, particularly the use of dual-trigger logic, rotation, and escalating deterrent outputs. The ethical and non-lethal framing is also appropriate and well aligned with the brief. However, the work does not clearly explain the core dynamics and control principles expected at Level 4. In particular, key concepts such as the plant model, feedback loop behaviour, and controller rationale are not explicitly developed beyond basic “if detected then...” logic. This limits the depth of the control systems analysis. Feedforward: To improve, you should explicitly link your design to fundamental dynamics and control concepts. Clearly define what system is being controlled (for example motor speed/position, deterrent output strength, or detection reliability), what is being measured, and what the overall control objective is. You should also identify relevant disturbances or noise sources, such as environmental effects or sensor uncertainty. It is also important to define key technical terms that are currently used implicitly. These include thresholding, feedback, stability, response time, and false positives/negatives. Making these concepts explicit and linking them directly to your system design will significantly strengthen your control analysis and demonstrate clearer understanding of Level 4 engineering principles.	20	11

3. Cognitive and Intellectual Skills: Use your analytical skills to develop and explain models, interpret results, and justify your design choices with clear reasoning and evidence.		
Feedback: You make logical design choices, including dual-sensor validation and an escalation strategy when presence persists. You also describe system behaviour in a clear step-by-step manner and include a block diagram/flowchart, which helps communicate the overall logic of the system effectively. However, the report is mainly descriptive in nature, with limited quantitative evaluation. There is little use of performance metrics or justification of parameter choices. The simulation section describes outcomes but does not include measured results such as plots, timing data, detection range estimates, or analysis of power versus duty cycle. Feedforward: To strengthen your work, include justification using simple engineering metrics. For example, consider detection range and field coverage (including the effect of rotation speed), response time from detection to activation, and how effectively your design reduces false triggers. These will help move your evaluation from descriptive to analytical. You should also include a comparison of at least two alternative design approaches. For example, compare PIR-only versus PIR plus ultrasonic sensing, constant deterrent output versus adaptive escalation, or a rotating deterrent system versus multiple fixed nodes. For each option, justify your design choice using clear trade-offs such as cost, reliability, power consumption, and effectiveness. This will significantly improve the depth and quality of your evaluation.	20	10
4. Practical Application Skills: Apply what you know by modelling and simulating the system, considering real-world factors like cost and power supply, and show how your design works in practice.		
Feedback: Your work shows good practical application. You clearly specify components, implement functional logic in Arduino code, include a system diagram, and present both power and cost tables. You also propose a realistic physical build, including weatherproofing considerations, which strengthens the engineering relevance of your design. However, the brief requires MATLAB/Simulink (or equivalent) modelling of a dynamic or control system. What you currently present is closer to a circuit-level prototype and behavioural description rather than a model of system dynamics and response over time. As a result, the control and systems aspect of the assignment is underdeveloped. There are also some technical and practical issues in the design. The power sizing appears inconsistent or optimistic in places. For example, the Arduino Uno is listed with “12V” in the voltage table, which is misleading. Current draw assumptions for components such as NeoPixels are likely underestimated, especially under higher brightness conditions, and duty cycle assumptions are not clearly quantified. The battery table also lacks clarity (e.g. “Ni-PRO... 30, 2 Ah”), and the relationship between available capacity and required energy is not clearly justified. Feedforward: If Simulink (or equivalent) is required, you should model at least one subsystem dynamically. Suitable examples include modelling motor rotation as a first-order system, representing sensor trigger logic with delays, or modelling the power system using duty cycle-based energy flow. This would demonstrate system behaviour over time rather than just static operation. You should also revise your power calculations using realistic operating conditions. This includes separating standby and active modes, using realistic current draw values (including LED brightness and buzzer consumption), accounting for motor stall current margins, including regulator losses, and basing solar sizing on effective sunlight hours rather than nominal panel ratings. This will significantly improve the technical accuracy and credibility of your design.	20	12

5. Transferable Skills for Life and Professional Practice: You will be assessed on how clearly and professionally you write your report and organise it (15 marks). Your ability to present your work confidently and effectively in the presentation and answer questions will be evaluated. This includes communication, organisation, and attention to detail (10 marks).		
Feedback: Your report is generally readable and well organised, with a clear contents page, structured headings, and a logical flow from problem definition through to design and costing. The presentation slides are also clear and aligned with the report, which supports understanding of your overall system. However, including key system diagrams within the presentation could have improved visual engagement and helped communicate the design more effectively. There are still issues with academic writing conventions. Referencing is inconsistent (Harvard style not fully applied), citation formatting is irregular, and overall presentation would benefit from closer attention to formal academic standards. In addition, there are several proofreading issues such as spacing, capitalisation, and occasional unclear phrasing. Some required report sections, particularly a full Discussion/Evaluation, are only partially developed or missing. Feedforward: You should add a dedicated Discussion and Evaluation section. This should include system limitations, risks (such as theft, weathering, and habituation), a basic maintenance plan, and a clear explanation of what field testing would measure (e.g. detection reliability, false trigger rate, response time, and durability). Careful proofreading is also needed to improve consistency and professionalism. Address spelling and typographical issues (e.g. “busser” vs “buzzer”, “Thiswill”), and ensure correct spacing around units (e.g. kg, Hz). Finally, improve the quality of your diagrams by making them more engineering-standard. This includes clearly labelled inputs and outputs, consistent use of units, and clear signal flow. This will strengthen the clarity and technical communication of your design. Report Writing: 8/15 PP 5/10	25	13

Assessment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)		49
	Up to 1 week late (40% Max)		
	Over 1 week late (0%)		

