

STUDENT FEEDBACK FORM: JAMES WHELAND

Generic Assessment Criteria	Mark s availa 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 (Havard style).		
Feedback: You have made an effort to justify your design choices using sources (for example, referencing ultrasonic deterrence and alternative repellents). You have also included a reference list and attempted in-text citations, which is a positive step towards supporting your work with evidence. Feedforward: To strengthen your report, you should aim to use more appropriate academic and technical sources. The current selection is quite limited and mainly based on general websites and your own TinkerCAD link. For a Level 4 dynamics and control assignment, you are expected to draw on more authoritative material, such as textbooks, journal papers (e.g. IEEE or Elsevier), component datasheets, and MATLAB/Simulink documentation. There are also issues with the use of Harvard referencing. The formatting of both in-text citations and the reference list is inconsistent, with problems such as capitalisation, missing publisher or website details, unclear authorship and inconsistent dates. Reviewing the correct Harvard style and applying it consistently would improve the professionalism of your work. A key area to develop is the use of evidence throughout the report. At present, only a small number of sources are cited, and much of the discussion is unsupported. Try to integrate references more regularly to justify your design decisions, modelling approach and evaluation. This will significantly strengthen your analysis and help you meet the assessment criteria more fully.	15	4
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 show a clear understanding of the scenario constraints, including the lack of grid power, the need for a low-cost solution, and the fact that monkeys may adapt over time. You also describe the main subsystems (power, detection and deterrent) clearly, along with a basic trigger-based behaviour, which helps the reader follow your design. Feedforward: To strengthen your work for a Dynamics, Control and Instrumentation module, you need to move beyond a descriptive build summary and demonstrate your understanding of core control concepts. For example, you should clearly identify elements such as the system input/output, disturbances, plant, controller, sensor and actuator, and explain how they interact. At present, describing the system as a “closed-loop control system” is not fully justified. The system detects motion and activates outputs, but it does not appear to use feedback to regulate a controlled variable (e.g. deterrence effectiveness). You may want to reconsider whether this is better described as an open-loop system, or explain how feedback could be incorporated. It would also strengthen your analysis to define clear performance requirements, such as detection range, probability of detection, false trigger rate, response time and energy usage. You can then link these requirements to your design choices, showing how your system meets (or could meet) these criteria. This will help demonstrate a deeper understanding of engineering decision-making within a control context.	20	9

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 have identified relevant limitations, such as false triggers, buzzer loudness and the risk of habituation, and you suggest sensible improvements including weatherproofing and sensitivity adjustment. This shows good awareness of practical challenges and how the design could be developed further. Feedforward: To meet the requirements of the assignment more fully, you need to incorporate mathematical modelling and control analysis into your discussion. For instance, you could model the detection stage as a threshold-based system, represent timing behaviour in terms of duty cycle and energy consumption, and describe the triggering logic as a simple discrete-time control process. You could also strengthen your work by comparing different control strategies, such as varying timing patterns, introducing randomisation to reduce habituation, or exploring adaptive triggering. Evaluating these approaches using quantitative performance measures would demonstrate a deeper level of analysis. Finally, aim to support your discussion with evidence and justification. Rather than stating that the system “works effectively”, explain how you know this, for example, using simulation results, calculations or references, so that your conclusions are clearly supported.	20	6
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: The TinkerCAD wiring description is clear and mostly technically coherent. The code demonstrates basic instrumentation and control logic (reading the PIR sensor and triggering an LED and tone), which is appropriate for a prototype-level implementation. You also provide a costed bill of materials, which is relevant and aligns with the low-cost requirement of the brief. Feedforward: The simulation requirement has not yet been fully met. The brief specifically asks for a MATLAB Simulink (or equivalent) simulation of system behaviour and response. At present, the work relies on TinkerCAD and a partial Arduino sketch, but it does not include a structured simulation study with defined scenarios and plotted results to analyse performance. The power subsystem also needs further development from a design perspective. While it is described, it is not fully engineered. You should include solar panel sizing, battery/storage selection, estimated current draw, duty cycle calculations, and a discussion of how the system would operate under low-light or night-time conditions. This would make the design much more realistic and robust. For the code, the structure is generally suitable, but key parameters need justification. For example, the choice of 20,000 Hz, activation time, and sampling delay should be linked to component specifications or relevant references. You should also explain how these values relate to the overall system requirements, such as response time and power consumption.	20	10
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 shows a clear basic structure with appropriate headings and is generally easy to follow. The content is understandable, and your PowerPoint slides are logically sequenced, matching the overall storyline of the report (problem → challenges → system overview → cost → conclusion). The slides are also concise and readable, which helps communication.	25	14

Feedforward: To improve the professionalism of your work, you should focus on consistency in presentation. There are several formatting and typographical issues (e.g. “tinker cad”) as well as some grammar errors that reduce clarity and impact. A careful proofread would significantly improve the overall quality.

At Level 4, your report also needs stronger technical depth. Key areas such as mathematical modelling, simulation results (e.g. plots), and evaluation against defined system requirements are currently missing or underdeveloped. Strengthening these will help demonstrate a more engineering-focused approach. Academic style also needs improvement, as some informal phrasing is present (for example, “whilst their sleeping/eating”). Ensure that all technical claims are supported with appropriate references.

For your presentation, aim to include at least one block diagram, one piece of technical analysis (such as a state diagram or timing logic), and one quantified result (for example, duty cycle, power estimate, response time, or detection assumptions). You should also include citations on slides for key claims, using a shortened Harvard style where appropriate.

Report Writing: 9/15

PP Presentation: 5/10

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)

Up to 1 week late (40% Max)

Over 1 week late (0%)

43

