Dissertation Rubric

## Design and Implementation [30%]

### System Modelling [10%]

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| **Level** | **Criteria** |
| 0 | Section missing, or unable to meet the next rubric level. |
|  | Methods used maybe overly simplistic and/or not suitable for the intended application. |
| Pass | Student demonstrates the use of simulation and/or analytical methods to model/design their project and makes an attempt at discussing the limitations.  Analysis may be simplistic in application and demonstrate little to no original thought beyond that of reference materials (e.g. software tutorials). |

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| +++ | Clear discussion of the limitations and/or trade-offs of the techniques with reference to the project specification, application area, and wider context. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| +++ | The methods / tools / techniques that are used are justified with respect to the project specification, application area, resources, and wider context. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++++ | Demonstrate application of the methods / tools / techniques to successfully address the project specifications. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

### System Development [10%]

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| **Level** | **Criteria** |
| 0 | Section missing, or unable to meet the next rubric level. |
|  | Development is significantly lacking, and it is clear that little actual effort has been expended on the project. |
| Pass | Student demonstrates ability to take designed and modelled system into a ‘real world’ environment (note this may be through an actual build or a further refined simulation). Expected challenges from this process are discussed and compensated for. |

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| +++ | The development makes use of bespoke methods, created by the student, to meet the project specifications. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| +++ | Student has demonstrated competency with a range of tools throughout the development of their project. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| +++ | The development shows a clear progression of their methodology adhering to engineering principles. All changes from the original methodology are both explained and justified well. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| +++ | Clear evidence of sub-system testing to validate individual components before integration. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

### Use of literature to support engineering work [10%]

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| **Level** | **Criteria** |
| 0 | No use of literature, or unable to meet the next rubric level. |
|  | There is some attempt to reference where supporting material is used but it is unclear what aspects of the project are original work and which are from external material. |
| Pass | Student makes clear referenced use of sources to support their project development. May be from poor sources or focussing on a single type (e.g. website). IEEE/IET style is, by-in-large, followed correctly. |

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| ++++ | Student clearly identifies how they have adopted and/or adapted the referenced material to add value to their project. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++ | All materials are from high quality sources (e.g. manufacturer, peer reviewed, textbook) and a range of types (datasheets, app notes, tutorials, code samples, etc). | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++ | Limitations of the referenced sources are considered with respect to the project needs, application area, and specification requirements. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | Referencing is used consistently throughout the implementation section to support all aspects of project design and development. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

## Final System Testing and Validation 25%

### Specification validation [15%]

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| **Level** | **Criteria** |
| 0 | Section missing, or unable to meet the next rubric level. Results are provided with no context. |
|  | Results are not used to validate specification. |
| Pass | Student captures results from their project and uses these to validate against the specification list. Analysis of results may be rudimentary (e.g. only stating visible features/trends). |

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| ++++ | Results are compared with expectations which may be from modelling, literature, or component/method performance differences. Pass/fail criteria is given. Unexpected results are explained well with suitable attempt to validate the explanation. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | Detailed statistical/quantitative analysis of results are carried out to ensure confidence in accuracy and repeatability. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | Every point in the specification list is validated successfully. Where specification points are not met there is clear explanation why, with analysis of the impact on the overall functionality/aim of the final system. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

### Presentation of testing setup and results [10%]

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| **Level** | **Criteria** |
| 0 | No results have been presented. |
|  | Some results but the chosen format is unintelligible / confusing. |
| Pass | Testing setup and results are presented using suitable figure types (image, bar, scatter, pie, etc). These are clear with suitable labels, readable axes and correct units etc. |

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| +++ | Use of a range of figure/table types, as appropriate for the data being displayed, with suitable axis scales, units, and labels. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| +++ | Clarity of comparison: highlighting/indication of key aspects and features for further discussion (e.g. subfigures, arrows, circles, etc). | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| +++ | Logical ordering of results, structured intuitively with the discussion sections. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| +++ | Testing setup details the test conditions and procedures, with justification. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

## Conclusion 15%

### Consideration of system within the wider context [5%]

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| **Level** | **Criteria** |
| 0 | Section missing, or unable to meet the next rubric level. |
|  | Student summarises their work but has limited or no discussion of the wider background. |
| Pass | Student reviews their final system with respect to the wider background. This can include consideration of health & safety, diversity, inclusion, cultural, societal, environmental, and commercial matters, codes of practice, and industry standards. |

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| ++++ | Detailed considerations are made to how the project would next be developed these include details of resource (cost, time, etc) requirements. This covers both immediate and longer-term developments. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | Assessment of the final project demonstrates a strong understanding of how it fits within a wide societal context. Including consideration of health & safety, diversity, inclusion, cultural, societal, environmental, and commercial matters, codes of practice, and industry standards; all as applicable to the project. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | Summary of the current state of the project including full listing of the status of every specification point and the overall project aim. Where points are not met these are accompanied by a suitable explanation, where everything is met the challenge posed by the project is clearly shown. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

### Reflection on Management [10%]

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| **Level** | **Criteria** |
| 0 | Section missing, or unable to meet the next rubric level. |
|  | Very limited reflection with no lessons learnt. |
| Pass | Student will reflect upon the progress of their project in terms of the project management. They must have an included an appendix containing copies of monthly progress review pro-forma’s, which they refer to. Lessons learnt will be discussed but may be unclear how these would relate to future projects. |

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| ++++ | Project management skills that have been developed are clearly described in a way that is suitable for future engineering projects. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | Reflections on progress and any actions undertaken to keep the project on track supported by reference to the review documents. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | The success of the risk mitigation strategies are evaluated, with suitable learnings that can be applied to future projects given. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

Quality of Communication 5%

### Communication Quality and Overall Completeness of Document 5%

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| --- | --- |
| **Level** | **Criteria** |
| 0 | No submission or unable to meet the next rubric level. |
|  | The dissertation is incomplete and/or poorly presented or written. |
| Pass | The dissertation is given as a complete document that would allow another person, with a technical background but unfamiliar with the project, to continue or repeat the work. The overall document follows a suitable layout and has an acceptable presentation with expected document features (section headings, page numbers, contents page). |

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| ++++ | Consistent use of styles throughout the thesis including headings, page layout, captioning, etc. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | Inclusion of tables of figures, tables, abbreviations, and symbols where applicable. Correct use of cross-referencing throughout the document. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | Overall quality of written communication is excellent. Concise with correct grammar, spelling, etc. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

[Moderator Only] Dissertation Defence 25%

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| **Level** | **Criteria** |
| 0 | Student did not attend, or unable to meet the next rubric level. |
|  | Student is unable to answer simple questions about the project. |
| Pass | The work of the project (including aim) is well explained with suitable demonstration (e.g. live, video, results discussion) of the final system. Student clearly states which specification points have been met and discusses any deficiencies. Basic questions about the students experience of the project are handled well. |

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| ++++ | Questions about the project specifics (including methods applied, reasoning, validity of results) are expertly handled. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | Questions about their personal development and experience working on the project are expertly handled. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | Questions reflecting on their planning process and how the project went are expertly handled. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | Student gives a high-quality delivery that is confident, enthusiastic, and professional, whilst providing genuine insight into the project work. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

[Supervisor Only] Professionalism and Self-Management 25%

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| **Level** | **Criteria** |
| 0 | Little to no attendance at meetings, no evidence of progress between meetings. |
|  | Student demonstrated limited aspects of self-management during the project and required micromanagement to make progress. Meetings often missed with no notice or explanation. |
| Pass | Student demonstrated some aspects of self-management during the project and did not require complete micromanagement. Meetings were attended inline with the expectations of the supervisor (including provision of agendas where expected). |

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| ++++++++ | Purely self-motivated with a consistent high level of effort applied throughout the project. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |

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| ++++ | Student has a professional approach to supervisor contact and arrives to meetings prepared to maximise value of time spent. | | | | |
| Not present | | Some | Most | Fully met | Exceeded |