

PHYS5014M MPhys Projects: Assessment Criteria

The nature of the module, in which every project is different and where theory/simulations/experiments coexist, makes it impossible to provide an exhaustive checklist of the criteria and possible factors that could be used for each form of assessment. The statements in the tables below suggest some of the criteria that a supervisor or assessor might use against the corresponding headings on the mark sheets. These statements are therefore *indicative* of what characteristics students' work will have rather than being *prescriptive*. For example, a Physics pedagogy project might have not any high level physics, but the statistical analysis of the data would be expected to be at the highest level. Similarly, the data obtained in an experimental project would be expected to be fully analysed according to theory, but it might not be as comprehensive as a project where data is provided to the student at the start of the project, as they spend the semester obtaining the data. It is up to the judgement of assessors to ascertain the quantity and quality of the work presented.

Specific guidance about the Executive Summary:

The executive summary replaces the usual Abstract, and should provide a one-page overview of the project report that emphasises the importance and applicability of the work and area and gives the key results and findings. It should be written to be accessible to an educated lay person, for example, someone who might be starting a science degree.

The executive summary should be formatted consistently with the rest of the report and may include figures where appropriate to the points being made. It should only include information and points made in the main text and is not an additional page of introduction or background.

It generally should not include references as all statements should relate to matters in the main text of the report (where any necessary referencing is done). Exceptionally, statements that need further support that are not referenced in the main text should be supported with footnotes on the executive summary.

It is assessed both for its content as a fair representation of the material in the report and also for the effectiveness of communicating the material at a suitable level for the intended audience. The second assessor has the main role is assessing the Executive Summary.

Continuous Assessment – marked by Supervisor

Aspect	<50%	2.2 : 50-59%	2.1 : 60-69%	1 st : 70-84%	Outstanding 85-100%
Quality of the research carried out	No results obtained or results meaningless due to failure to apply the scientific method; student seriously damaged equipment or worked in an unsafe manner. Notebook contains little or no information relating to experimental work carried out.	Some results obtained but limited due to poor use of equipment/technique /method. Notebook includes only some of the most critical points to reproduce work. Results included as loose pages, without dates and/or data not recorded in a safe environment.	Results obtained are reasonable for the given facilities (equipment/ code/ data/ background) but not necessarily optimising what was available. Notebook contains most parameters and evidence of key analysis with dates but is not fully comprehensive.	Results are performed at the optimum level (consistent with the facilities provided). Notebook contains full details of experimental parameters, dates, data taken, methodology and results analyzed.	Results are consistent with what would be expected from a skilled first year PhD with the same facilities. Notebook provides rigorous trail of parameters, methodology and data. It also contains critical views of data with observations and theories to investigate.
Critical Faculties and Independence	Student did not demonstrate any degree of critical thinking even when prompted, did not take action on own initiative or when told to do so. No engagement in critical discussion with the supervisor. No effort made to solve problems even with assistance.	Student demonstrated limited critical thinking when prompted. Student did not work independently of demonstrator. Minimal engagement in critical discussion with the supervisor. Prepared to solve problems only with direct supervision, unable to diagnose problems independently.	Student demonstrated some evidence of ability to think critically. Main results are analysed with appropriate theory/models with uncertainties. Some engagement in critical discussion with the supervisor. Independently diagnose problems, but requires supervision to solve problems.	Student applied independent critical judgment when considering results. Help needed to analyse results only while learning new techniques. Results are analysed within the context of literature and make use of uncertainties as required. Proactive engagement in critical discussion with the supervisor. Diagnosed and corrected problems as they arose.	Added knowledge by independent work/analysis applied to the project. Critical judgment shown in the interpretation of results beyond discussions with supervisor. Creative engagement in discussions with the supervisor. Problems diagnosed and solved independently, with improvements to technique/methodology investigated.
Overall project planning and management	Student has failed to complete activities, failed to turn up for meetings, was absent without good explanation. Disruptive use of infrastructure.	Student has wasted time and/or failed to complete key activities without good reason. Student was late for meetings without good explanation.	Student has managed to complete most tasks. Student has needed advice to set reasonable timelines.	Student has completed the required tasks for the lab, managing their time well. A project conclusion has been obtained that is coherent with the task(s) engaged.	Student has set realistic deadlines and timescales, prioritized activities and reached a project conclusion beyond expectations. Optimal use of infrastructure.
Extension of project beyond initial set goals (final CA):	Student failed to complete most of the set tasks let alone extend the work.	Student completed only the more straightforward tasks without extending the work.	Students completed set tasks but did not extend project significantly.	Students managed some degree of extension beyond set tasks.	Student independently devised extension to project.

Note: These guidelines can be used to provide feedback during weekly meetings and in the feedback form for continuous assessment –with additional detail.

Viva Assessment - marked by main Assessor and Supervisor

Aspect	<50%	2.2 : 50-59%	2.1 : 60-69%	1 st : 70-84%	Outstanding 85-100%
Knowledge of background physics, including relevant undergraduate physics and literature	Unable to explain the physics behind the project.	Able to explain some of the relevant physics but limited in understanding to level 3.	Able to explain background physics to a level at or beyond level 3 –may need some prompting or help to point in the right direction.	Able to explain background physics demonstrating some knowledge gained by independent study and can answer questions that are not straightforward related to the project.	Able to explain background physics demonstrating substantial knowledge gained from independent study. Able to discuss the physics at the level of a PhD transfer viva (first year progression).
Explanation of the work at suitable level	Unable to explain what was done or why it was done.	Able to explain some aspects of what was done but without coherent explanation of why.	Able to give coherent account of what was done with some ability to explain why it was done justifying conclusions.	Able to give a coherent account of what was done and why, justifying conclusions on the basis of results.	Able to give full account of experimental activity and conclusions, supporting with evidence from own work and other sources.
Ability to answer questions related to the topic of the project	Unable to answer even questions on basic physics.	Attempt answer to questions but limited in understanding to level 3 Physics.	Able to answer straight forward questions (e.g. technical details) and attempts answer to more complex questions with some prompting.	Able to answer more complex questions often with little or no prompting.	Able to answer confidently and in full all questions with no prompting. Can connect questions to the broader context of physics/literature.
Ideas for future and/or related work	Demonstrated little or no understanding of the work that was supposed to have been done. Unable to provide any suggestions for extension beyond the very trivial (e.g. measure more samples).	Ideas for further work limited to basic changes in framework (e.g. alter measurement temperature) or without specifics as to how better results can be achieved (e.g. measure in a more stable environment).	Able to present some ideas that would extend or improve the study.	Ideas for future and related work clear and justified by reference to results or weaknesses in experimental technique.	Ideas for future work and extension clear, justified by reference to own work or the literature and showing evidence of critical evaluation of possible improvement.

Oral presentation – marked by main Assessor and Supervisor

Aspect	<50%	2.2 : 50-59%	2.1 : 60-69%	1 st : 70-84%	Outstanding 85-100%
Structure and organization	No discernible structure or organisation to the talk, slides unreadable and/or irrelevant.	Poor structure or organisation, some slides unreadable. No conclusions or introduction.	Reasonable structure and organisation. Too many slides for introduction or conclusions, or too much text in the slides.	Clear demonstration of good structure to the talk with all the slides well put together to convey an introduction to the topic, key results and a clear set of conclusions.	Perfectly structured with the audience lead from one point to the next seamlessly.
Use/quality/relevance of visual aids such as figures, graphs etc.	No use graphs or schematics.	Graphs are difficult to read due to small font size or colour schemes. Units are not correct or consistent. Error bars not displayed. Other graphics are of no or little help.	Graphs convey some of the main results and there are other figures to help explain the topic. Some slides contain too many or unnecessary/unused graphs.	All results clearly resumed and displayed in graphics that use the right formatting. Schematics or other figures contribute to the understanding of the project.	The graphs are clear, free of mistakes and make easy to understand the main results. Significant work in using visual aids to convey the physics behind the results.
Verbal skills and interaction with the audience	Inaudible, disorganised, no meaningful attempt to explain the content.	Difficult to follow, showing data not referred to, reliant on written notes/text/cue-cards.	Presentation mainly clearly delivered with some stumbles. Occasional reliance on notes.	Clear presentation on the whole using an appropriate register.	Clear, fluent and confident presentation, with no significant hesitations and all elements well explained.
Appropriate level of scientific content, including background physics, current state of the art and critical analysis.	Lacking in degree level physics content or entirely unintelligible to a non-specialist member of staff.	Lacking physics content beyond what would be taught at level 3 or some substantial parts too advanced for non-specialist staff to follow.	Scientific content includes some material that goes beyond level 3 physics but without clear connections. Background physics not fully explained or project not linked to the state of the art.	Scientific content leads the audience from 2 nd /3 rd year physics to higher levels in a clearly connected narrative that links the project to the state of the art in the field.	Scientific content leads the audience from under-graduate to higher levels in a clearly connected narrative with independent study/development of appropriate concepts and analogies.
Timekeeping (assumes a 20 min talk)	Failed to finish within 25 min or took less than half the time allotted, <10 min.	10-15 or 23-25 min. No time for questions or talk runs for less than 15 minutes. Completely misjudged amount of content.	15-18 or 21-23 min. Only time enough for a few quick questions or runs for less than 18 minutes. Obvious rushing or time-filling.	18-19 or 20-21 min. Left adequate time for questions but with some degree of rushing or time filling.	19-20 min. Left adequate time for questions without having to rush or obviously fill time (well-paced).

First Assessor marked Final Report

Aspect	<50%	2.2 : 50-59%	2.1 : 60-69%	1 st : 70-84%	Outstanding 85-100%
Quality of Introduction and understanding of context with literature	Lacking in degree level physics content or hopelessly confused.	Level 3 Physics content only. Significant number of substantial and important errors. Background equations wrongly displayed and/or with terms not defined.	Broadly correct content that goes beyond 3 rd year physics with minor errors of fact or omissions.	Content is correct and written at a level substantially beyond 3 rd year, making use of material from appropriate sources to introduce the experiment.	Content is correct and draws upon a variety of sources to introduce the experiment clearly demonstrating a thorough understanding of the underlying physics close or at graduate level.
Quality/relevance of the figures/data presentation	No relevant or useful figures or no data presented in report.	Substantial defects in many figures – e.g. illegible/unlabelled axes, uninformative figure captions.	Most figures of acceptable quality but could be improved or have better figure captions.	Figures clear and well described by figure captions to make understanding the data easy.	Figures clear and put together in a way that highlights significant data with informative captions.
Discussion & Conclusion	Provides little or no discussion, no attempt to analyse data critically or synthesise conclusions. Little or no evidence of thought beyond displaying the data.	Some discussion and evaluation of results but vague, without original insight, or limited to restating of findings. Missing uncertainties, lack in critical analysis or work not placed in context.	Discussion and evaluation of results mostly following the established facts in the field as explained by supervisor/demonstrator. Uncertainties not correctly calculated or displayed, lack in critical analysis or work not placed in context.	Discussion of results and key findings placed in context of expected results, reasonable attempt to synthesise an overall conclusion discussed within the state of the art for the field with individual insight.	Discussion involves critical analysis and placing in context. Full, critical analysis of the results, cause(s) for problems and/or unexpected findings. Independent study leading to a strong conclusion of main points.
Written English and style	Poor structure, missing sections, page numbers or leaving out substantial material. Poor use of English makes it difficult to understand or obscures the meaning of some passages.	Occasional flaws in English may hinder understanding in places. Conclusions, further work and/or introduction not well defined with clear arguments. No table of contents.	A standard sectioning and organisation. Some sections are overly long/detailed while others miss important points. Periodic typographical and/or grammatical errors.	Well-structured and well organised. Explains main results, conclusions and future work English largely correct with only minor, sparse typographical errors.	The report is easy to read, highly informative and free from mistakes. All sections have the appropriate length and include sufficient detail to reproduce and extend the work.
Referencing	Referencing incorrectly used (e.g. Wikipedia; no citations in text; missing key aspects that make impossible to find the work). Makes excessive use of text taken directly from sources.	References not placed in text properly. Sources not complete, missing or incorrectly citing journal, author etc. Number of citations significantly low.	Minor inaccuracies in referencing such as formatting inconsistencies. Missing latest research or some key papers.	A few minor inaccuracies such as some inconsistencies in style. Numerous research papers included. Websites include author and access date.	The list of references is comprehensive and in an accepted style.
Writing Threshold Standard	Work that fails to meet this standard must be referred to the module leader.	Paragraphs are used. There are links between and within paragraphs although these may be ineffective at times. There are attempts at referencing. Word choice and grammar do not seriously undermine the meaning and comprehensibility of the argument. Word choice and grammar are generally appropriate to an academic text.			

Second Assessor marked Final Report

Aspect	<50%	2.2 : 50-59%	2.1 : 60-69%	1 st : 70-84%	Outstanding 85-100%
Style and Quality of Executive Summary	The executive summary is written in noticeably poor formal English or an inappropriate register for a formal lay summary. The content is not at the correct level for an educated lay person to understand.	The executive summary is written in mostly correct formal English, and mostly using the correct register. The level of content assumes a bit too little or too much knowledge of the reader.	The executive summary is written in correct formal English aside from some minor errors, using the correct register and the level of content is mostly correct for the intended audience.	The executive summary is written in correct formal English aside from occasional and minor typographical errors generally using the correct register and apart from occasional points, the level of content is correct for the intended audience.	The executive summary is written in correct formal English using the correct register and the level of content is consistently correct for the intended audience. Written with flair.
Executive Summary – content as a summary	Executive Summary does not describe the significance and impact of the area or does not describe the key findings or outcomes.	Executive Summary indicates the area of study but with little success in demonstrating its importance. Some of the key findings and outcomes are identified and/or the descriptions are limited	Executive Summary identifies the area of study and indicates the significance and importance. The key findings are identified and mostly well described	Executive Summary fully identifies the area of study and provides a clear statement of the importance and significance. All of the key findings and outcomes are described with a good attempt to place them in the context of the research area.	Executive Summary clearly and fully describes the significance and importance of the research area, fully describes the outcomes and findings and places them in the context of the research area.
Quality of Introduction and understanding of context with literature	Lacking in degree level physics content or hopelessly confused.	Level 3 Physics content only. Significant number of substantial and important errors. Background equations wrongly displayed and/or with terms not defined.	Broadly correct content that goes beyond 3 rd year physics with minor errors of fact or omissions.	Content is correct and written at a level substantially beyond 3 rd year, making use of material from appropriate sources to introduce the experiment.	Content is correct and draws upon a variety of sources to introduce the experiment clearly demonstrating a thorough understanding of the underlying physics close or at graduate level.
Quality/relevance of the figures/data presentation	No relevant or useful figures or no data presented in report.	Substantial defects in many figures – e.g. illegible/unlabelled axes, uninformative figure captions.	Most figures of acceptable quality but could be improved or have better figure captions.	Figures clear and well described by figure captions to make understanding the data easy.	Figures clear and put together in a way that highlights significant data with informative captions.
Written English and style	Poor structure, missing sections, page numbers or leaving out substantial material. Poor use of English makes it difficult to understand or obscures the meaning of some passages.	Occasional flaws in English may hinder understanding in places. Conclusions, further work and/or introduction not well defined with clear arguments. No table of contents.	A standard sectioning and organisation. Some sections are overly long/detailed while others miss important points. Periodic typographical and/or grammatical errors.	Well-structured and well organised. Explains main results, conclusions and future work English largely correct with only minor, sparse typographical errors.	The report is easy to read, highly informative and free from mistakes. All sections have the appropriate length and include sufficient detail to reproduce and extend the work. Smooth, stylish writing.
Referencing	Referencing incorrectly used (e.g. Wikipedia; no citations in text; missing key aspects that make	References not placed in text properly. Sources not complete, missing or	Minor inaccuracies in referencing such as formatting inconsistencies.	A few minor inaccuracies such as some inconsistencies in style. Numerous research papers	The list of references is comprehensive and in an accepted style.

	impossible to find the work). Makes excessive use of text taken directly from sources.	incorrectly citing journal, author etc. Number of citations significantly low.	Missing latest research or some key papers.	included. Websites include author and access date.	
Writing Threshold Standard	Work that fails to meet this standard must be referred to the module leader.	Paragraphs are used. There are links between and within paragraphs although these may be ineffective at times. There are attempts at referencing. Word choice and grammar do not seriously undermine the meaning and comprehensibility of the argument. Word choice and grammar are generally appropriate to an academic text.			