Imperial College London

YEAR 3 PROJECTS/ESSAYS ("BSc Projects") GUIDELINES

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14 September 2022

1. Introduction

Third year laboratory projects provide an important opportunity for you to develop a combination of experimental, analytical, numerical, organisational, and presentational skills. These skills are difficult to acquire within the strict confines of a set experiment of the type you will have encountered in the first and second year labs. The projects provide an essential part of the training of final year BSc students. Projects are carried out in pairs, and you will have to partner up with another student.

Projects can also be taken in the form of Essays. Students will work with a supervisor to carry out mainly literature-based research on a specified physics topic and write an essay on it. The student will also give an oral presentation to the supervisor and a non-supervisorial assessor. **Essay projects are carried out individually.**

Projects are weighted at 9 ECTS and at 25 hours/ECTS. This means you should expect to put in approximately 225 hours of work for the entire project including work and write up.

A system for joining projects after discussions with potential supervisors is set up on the BSc Projects SharePoint Site. **It is your responsibility to use this system so that your project is tracked correctly**.

It is very important that the UG Office is aware of your choice of project type and choice of Term. This is for them to arrange access to the correct Blackboard area where submissions can be made. If you have changed your choice since declaring it last year, please let the UG Office know immediately

COVID Guidance – Although we expect full access to Departmental facilities this year, we should all make contingency plans for possible, new rounds of restrictions (lockdowns etc.). Please discuss the potential issues with your supervisor.

Format of interactions with the supervisor should also be covered during initial discussions. The default will be in-person meetings but please allow for flexibility due to individual circumstances. Microsoft Teams remains a useful alternative and will become the default if restrictions are imposed again.

2. Assessments

The assessment stages are identical for Projects and Essays:

a. **Project Plan**. This is a short report submitted in week 3 of term for single term projects, and week 5 of the first term for projects lasting two terms. It should include details of (a) the aims and objectives of the project (b) a brief summary of what you have found out so far (c) a plan for the remainder of the project. The plan has a limit of 800 words and two figures. Use a minimum 12-point font size. The project/essay plan does not contribute towards the final

project mark BUT **5% will be deducted from overall project mark if not submitted**. **Plans will be submitted to Turnitin on Blackboard.**

b. **Progress Report**. The progress report does not contribute towards the final project mark BUT **5% will be deducted from overall project mark if not submitted**. Once again, this should be submitted to Blackboard by 5pm on the day of the deadline. You will receive formative feedback directly from the supervisor. **Progress reports will be submitted to Turnitin on Blackboard.**

c. **Continuous Assessment** (20%). This is submitted by the supervisor using an online form. You will receive formative feedback directly from the supervisor around Week 9 of term.

d. **Project Viva** (20%). All students will give a short presentation (15 minutes plus questions) in **weeks 10-11 of term (ideally week 11)**. This provides an opportunity for students to explain what they have been doing to and audience of the supervisor, an independent assessor and any other invited parties. The supervisor and assessor will provide written formative feedback on the presentation which the student can use to help the final version of the report. **You will arrange a date and venue for the Viva with your supervisor and assessor directly.**

e. **Final Report or Essay** (60%). The project report (**maximum length 6000 words excluding figures**) will be marked independently by the assessor and a panel member. You will receive written summative feedback along with a joint mark for the report. Completed reports MUST be submitted to Blackboard by 5pm on the day of the deadline. You may also wish to email a version to your supervisor. **If you have any questions about essay projects, please see the Head of Projects as soon as possible to discuss them**. **Reports will be submitted to Turnitin on Blackboard.**

Students receive grade ranges and feedback from the graded assessment points (Continuous Assessment, Viva, Report). These are aggregated into a total numerical score only when passed on for review by the exam board (and confirmed at the examiner's meetings in July). **In practice, this means that students only get a final, aggregated numerical score with their yearly transcript along with other summative assessment results.**

Continue below for further guidance.

3. Deadlines and Submission Points 2022-2023

All deadlines are at 17:00 local time. **Blackboard submissions are highlighted in red**. Vivas must be held by the end of term but ideally in week 11 (week 10 is also acceptable). **Please format all submissions to include, Project Title, your CID, and Supervisor and Assessor names.**

Term 1 Projects	Term – Week	Deadline	Weight	Assessed by
Project Plan	1 – 3	Fri 21 Oct 2022	(-5% Penalty)	Supervisor (Feedback)
Progress Report	1 – 6	Fri 11 Nov 2022	(-5% Penalty)	Supervisor (Feedback)
Continuous Assessment	1 – 9	Fri 2 Dec 2022	20%	Supervisor
Report outline	1 – 10	Fri 9 Dec 2022	Optional	Supervisor (Feedback)
Viva	1 – 11	12-16 Dec 2022	20%	Supervisor + Assessor
Project Report	2 – 2	Tue 17 Jan 2023	60%	Assessor + Panel

Term 2 Projects	Term – Week	Deadline	Weight	Assessed by
Project Plan	2 – 3	Fri 27 Jan 2023	(-5% Penalty)	Supervisor (Feedback)
Progress Report	2 – 6	Fri 17 Feb 2023	(-5% Penalty)	Supervisor (Feedback)
Continuous Assessment	2 – 9	Fri 10 Mar 2023	20%	Supervisor
Report outline	2 – 10	Fri 17 Mar 2023	Optional	Supervisor (Feedback)
Viva	2 – 11	20-24 Mar 2023	20%	Supervisor + Assessor
Report	3 – 2	Tue 9 May 2023	60%	Assessor + Panel

Two Term Projects	Term – Week	Deadline	Weight	Assessed by
Project Plan	1 – 5	Fri 4 Nov 2022	(-5% Penalty)	Supervisor (Feedback)
Progress Report	1 – 10	Fri 9 Dec 2022	(-5% Penalty)	Supervisor (Feedback)
Continuous Assessment	2 – 6	Fri 17 Feb 2023	20%	Supervisor
Report outline	2 – 10	Fri 17 Mar 2023	Optional	Supervisor (Feedback)
Viva	2 – 11	20-24 Mar 2023	20%	Supervisor + Assessor
Project Report	3 – 2	Tue 9 May 2023	60%	Assessor + Panel

Continue below for detailed further guidance.

4. Viva Guidelines

The student should prepare a talk on their Essay Project of up to 15 minutes in length. The content, language, level and style of the presentation should be such that another competent student at the same level of undergraduate physics education should be able to follow proceedings. It is recommended, but not required, that PowerPoint is used.

Practice is the best advice to anyone giving a presentation, preferably with an audience. Rehearse the talk with a housemate present if possible. Bear in mind 15 minutes is a limit, not a target, though it is difficult to see how a talk under 10 minutes could do work at this level justice.

The supervisor organises the viva and is responsible for setting the date, time, location and acquiring any necessary presentation equipment (a PC screen in their office will usually be used though a projector and screen may be preferable).

COVID Guidance – Vivas should be in-person unless there is strong justification to move online (i.e., lockdowns or isolation). If Vivas are forced online the preferred method is using Microsoft Teams. Guidelines for scheduling and timings are unchanged. Microsoft Teams allows you to share a Power Point presentation and has some whiteboard functionality. It will be useful to practice use of Microsoft Teams in this way before the Viva.

The viva will last up to 30 minutes as follows:

a. A presentation by the student of up to 15 minutes.

b. As much time as is necessary (preferably 10 minutes but no to run over 30 minutes in total) for questions and discussion of content.

c. The student then leaves the room and the markers spend a short time discussing the presentation and how best to provide feedback to the student.

d. The student re-joins the markers and is provided with verbal feedback to assist in preparation of the final draft of the Essay project. They may also provide written feedback, but this is not a requirement.

After the viva the markers complete the mark sheet online through the form provided.

The Viva is assessed along four, equally weighted, aspects:

a. How well did the student explain the physics involved in the project?

b. How well did the student give a review of the work undertaken?

c. How confidently did the student express themselves when discussing the work and answering questions?

d. Quality of the presentation in the viva, time keeping, the logical structure, and the quality of slides, figures, and graphs.

5. Final Report (or Essay) Guidelines

The Project report or Essay offer an opportunity to develop research skills and one of the most important skills is the ability to communicate your work clearly and concisely in a written report. The projects cover a broad range of theoretical, computational and experimental topics, which differ greatly in scientific scope and potential. Hence, a few projects may lead to new results that can be published, and some may fail to work out, whilst the rest lie somewhere in-between. This is not unsurprising as research is about exploring the unknown. Therefore the assessment of the report cannot be based solely on the quality of the results obtained; it will be assessed on the efforts you made to tackle your research topic and the clarity and completeness of your explanation of this topic and what you have learned from it.

You should keep in mind that your report will be independently assessed by your project assessor and by a member of staff from the Marking Panel. Note that the Marking Panel member is not normally from the same research group as the project supervisor, i.e. the panel member is not an expert in the subject of the project. Therefore, it is very important that your report should be aimed at a physicist who has not worked in the area of your project. **Any reasonably experienced physicist should be able to read through your Project report or Essay and understand it.**

Word and page limits.

Report should be word processed using for example LaTeX or Word. The type size should not be smaller than:

a. Times New Roman 12pt or Arial 11pt for single column format.
b. Times New Roman 11pt or Arial 10pt for double column format.

The margins should not be smaller than those used in this document (2cm). The page size should be A4. The Report or Essay should be 4,000 – 6,000 words long, with 6,000 words being an **upper limit**. **The word count excludes, title page, contents page(s), acknowledgements, appendices, bibliography**. Everything else is included, i.e.; abstract, summary, figure captions, table captions etc.

This totals around 15 A4 pages in length (single column format) including figures and tables but excluding title page, contents page(s), appendices and bibliography. Only in exceptional circumstances may the report exceed the upper limit of 6,000 words and **only** after agreement from **both** the supervisor and assessor.

Structure of the Report

Title page with:

a. A title that clearly identifies what the report is about [note: this does not have to be the original title of the project proposal if another one is deemed more fitting].

b. Student's name and CID number.

c. The name of the supervisor.

d. The name of the assessor.

e. The word count.

Declaration of work undertaken: If you worked with a partner, then you must state how the work was distributed between you and your project partner (even if it was evenly split across all aspects,

this should be stated) You must also specify if you have had a summer placement or previous project/essay with the same supervisor and whether any of this project is an extension of that work. The declaration need not be done at the beginning but must be contained within the report somewhere deemed appropriate.

Abstract: The abstract should clearly and concisely identify the principal features of the work and the results achieved and the conclusions that can be drawn, if any. It must include a summary of your report (maximum half page). The summary should be readily understood by any physicist.

Content page(s): The contents pages list the chapters, sections, and subsections.

Introductory chapter: The Essay or Project Report should have an introductory chapter in which the aims and objectives of the project are established and in which the work is clearly put into context. The introductory chapter will be very important for the panel marker.

Discussions of the methods employed: The methods may be experimental, computational and/or theoretical as appropriate to the Project or Essay. For Essays this will include a survey and analysis of the literature specific to the topic being discussed.

Results: A clear description and presentation of the results/observations obtained. Think carefully how to convey the results with clarity and in the most informative way. Figures must have clearly labelled axes and scales and a descriptive figure caption that states what is plotted and stresses what the reader should take note of.

For an Essay this section should be a critical analysis of the research, standard results, and the latest understanding of the topic based on the summary obtained in the previous section.

Discussion/Conclusion: A critical discussion of the results and the experimental or computational errors, and the conclusions that can be drawn from the results should be included. In your conclusions you should discuss to what extent the aims of the project that you gave earlier have been achieved and what further work would be appropriate.

Essays should summarise the critical discussion in the previous sections and provide guidance for the future directions in the field/topics being discussed.

Acknowledgements: In a formal acknowledgement section refer to the people you wish to thank; do not include the name of your project partner but refer to them as your project partner.

Bibliography: You must provide a clear and extensive set of references (bibliography) to which you have referred in the text. These should be in the standard format used in scientific journals (usually Harvard or Vancouver style referencing) and I suggest that you should spend some time in the library to find out about this (see Library Referencing for further details).

Appendices (if appropriate): Lengthy mathematical derivations, computational algorithms, and large quantities of data that you wish to place on record should be included as appendices and do not count towards the page limit. **Those assessing the report won't normally read the appendices.**

It is most important that a reasonably experienced scientist should be able to read through your Project Report or Essay and immediately be able to follow, in detail, what you did to put your work into context and from your report be able to reproduce your BSc or Essay Project. Hence, it must contain detailed descriptions of the equipment used, dimensions of components and experimental layouts, manufacturer, type numbers, the precautions you had to take, anything which would help you in repeating the work in another laboratory in say 5 years' time.

If your project is computational similar comments apply. You need to describe exactly how you approached the computation, how you modelled the physics, how you set it up and what precautions you had to take to ensure computer rounding errors did not mess up the results or how you avoided inordinately long computational times, and perhaps most importantly how you verified that your programmes were correctly implemented (i.e., that they were doing what you thought they were doing) and that the results made sense.

In theoretical work details of and references to similar work are needed.

I must stress that reports must be complete and concise therefore avoid waffle and make sure that you back up any points you make. I leave it to you to make sure your Project Report or Essay is of a high quality and "professionally" written.

It is important for you to realise that most projects are never finished and so at the time you write your report, you will only be able to cover what has been done by that time, therefore plan to have achieved something by then if you can. In some cases, it may seem that little has been achieved, however this is no reason for not producing an excellent report covering many of the points made above.

Plagiarism: Plagiarism must be strictly avoided (penalties for this can be very severe). Therefore, never use the words or ideas of others (from whatever source they might arise e.g. published papers, the web or other student reports) without a proper attribution. Note that you may use material from your Progress Report. For further information on plagiarism, see Library Resources. **Reports will be submitted to Turnitin.**

You will not be required to provide a hardcopy of your report. All submission will be via Blackboard. Back-ups: Keep back-ups of your report to avoid losing your work. Also, remember to provide your supervisor with a copy of the final report and any programming/coding that was developed during the project.

Finally, keep a copy of your Essay or Project Report. It may be useful in, for instance, job or research studentship applications.

6. Working Safely

Working safely is a very important aspect of project work. Please discuss arrangements with your supervisor.

Projects involving laboratory work: supervisors must remember to complete all necessary safety inductions and conduct the hazardous area induction form with your students for each laboratory they will work in. If the student works at MSRH, they have you complete the MSRH lab eLearning before accessing the lab.

Please remember that lone working is not allowed for UG students.

Supervisors and students may find the following pages useful:

a. Main FoNS Safety SharePoint.

b. Basic Lab rules.

c. SOP and risk assessment forms.

d. Waste routes.

e. Salus page to report incidents and near misses.

f. Training record page.

The FoNS Safety Team is always happy to provide any additional safety information and advice, please reach to us if you have any questions: fonssafety@imperial.ac.uk.