Department of Electrical & Electronic Engineering

Final Year Individual Projects

EEE & EIE, MEng & BEng

Student Guide 2023-2024

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A machine-readable copy of this document is posted on the EEE project web pages:

https://intranet.ee.ic.ac.uk/t.clarke/projects/

Introduction

Objectives

The individual project is the most important single piece of work in the degree programme. It provides the opportunity for you to demonstrate independence and originality, to plan and organise a large project over a long period, and to put into practice some of the techniques you have been taught throughout the course. Whatever your level of academic achievement so far, you can show your individuality and inspiration in this project. The project is specified (in detail), driven, and planned by you alone, with advice from a supervisor. It is often the most satisfying piece of work in your degree. It is worth 35% (BEng) or 40% (MEng) of the final year marks.

Timescale

MEng Projects start as soon as they are allocated in the Autumn Term. Work continues until approximately the end of the Summer Term. The exact amount of time spent on projects is expected to be on the order of 50-60 days full time equivalent. You will work on your project part-time before the exams and full time afterwards. You need to take the work load involved in your final year project into account when choosing the number of options in each term.

BEng projects start in the middle of the Spring Term, and work proceeds full-time in the Summer Term. It is expected that you will start your literature study over the Spring vacation, in order to be fully prepared for full time project work in the Summer Term.

Projects dates can be found on the last page of this documented, or from the Blackboard diary.

Unlike group projects the individual project is free for you to plan timing of work. There is one assessed milestone – the Interim Report. The contents of this are in your control, so the project represents a chance for you to use the project management you have learnt so far and plan for yourself.

The Project Co-ordinator

Individual projects are coordinated by Dr Tom Clarke (Room 615 in the Department of Electrical and Electronic Engineering, email **t.clarke@ic.ac.uk**). You may contact him should you have any problems or queries regarding your project. Administrative matters are dealt with by Clare Drysdale (EEE Undergraduate Office, level 6).

The Project Web Pages

These can be accessed from the EEE Home Page via the intranet link, or with URL:

https://intranet.ee.ic.ac.uk/t.clarke/projects/

They are the definitive source of all published information about EEE projects. Please familiarise yourselves with their content.

Blackboard

The Final Year Projects Blackboard courses EE3-FYPRJ or EE4-FYPRJ are used for submission of some deliverables and detailed submission guidelines. Make sure you submit to the correct (current) year.

Choosing an Individual Project

The idea for your project may be a proposal from a member of staff or yourself, or perhaps a combination of the two. You should discuss the projects that interest you with the supervisors during the project selection period (see project dates). Note that not every project is suitable for every student, this depends on your interests and capabilities. Each proposal will indicate broadly these constraints in order to help you to make an informed choice, although many projects are quite flexible. We require you to discuss any project you select with the proposing staff. This discussion is essential because staff will be able to explore informally how you fit the project, and how it fits you.

After approximately 7 days of selection time your online preference lists are used to allocate projects under a global preference optimisation algorithm.

Self-proposed Projects

If you have your own idea for an individual project you should note that the deadline for submission of your proposal is somewhat before the final selection deadline, because any such proposal must be agreed by the Project Coordinator. I will try to expedite last-minute requests, if they pass, but with less time this may not be possible. You are encouraged if possible to discuss your proposal with potential supervisors, and a member of staff willing to supervise a self-proposed project is helpful, although the final allocation of supervisors is done at the discretion of the Project Co-ordinator, and especially for design and build projects I can always find supervisors for a good project. See Appendix 1 for more information.

Industrial Projects

We encourage students to put forward industrial projects - for example from placements. A wide range of projects are possible, we require that the work must be of appropriate academic quality but this is usually possible to meet. Proposals will be considered on a case by case basis and if rejected reasons given so that these may be corrected. See Appendix 1 for more information.

A list of MEng staff project proposals will be available on the project web pages and is normally complete by the first Monday of the Autumn Term. A few late-breaking projects may be expected: they will be highlighted as such. BEng projects are allocated separately from a new list which will be available in the Spring Term.

Allocation

Detailed information relating to project selection, including what to do if you are unable to be present in College over the period, will be distributed by e-mail during the Project Selection period.

You must complete the electronic Project Preference Form on the **student forms** page. You are required to fill in your project preferences, and are encouraged to nominate any "own" projects you would like to do. Your list should be ranked in order of preference; if you do not have any strong preference, you should indicate this on your form.

You should put possible projects on the list immediately, which will help provide you and the cohort with feedback on project popularity, During the project selection period, which normally takes about 1 week, you will change your list of possible projects. The final list, when project selection, closes is the only information we use to perform project allocation.

It is essential that you communicate with supervisors to obtain full information about all proposals on your list. Normally this is a face-to-face meeting but where this is impossible exchange of e-mail may suffice. Projects often have specific requirements not apparent from the description. If you select a project that is inappropriate for you, because you have not seen the supervisor, and are allocated such a project, it is no excuse that you selected it 10th choice and did not expect it would be allocated.

If you choose from the published proposals we will endeavour to give you your first choice of project. Typically 60% of the year obtain this, and 90% one of the first three choices, the few who have popular choices will be allocated a lower ranking choice.

DoC Projects for EIE

EIE students are allowed to select DoC projects. The details of this can be found from the DoC web pages. A student who expects to secure a DoC project can indicate this on his EEE online form and thereby opt out of EEE projects if the DoC allocation succeeds. DoC provides guidance about what is required to allow project allocation - please ensure that you follow these rules if you expect to have a DoC project. During EEE project allocation a decision will be made as to whether a DoC project can be allocated, or whether an EEE project must be allocated: Further information about this process can be obtained from Dr. Clarke: since this route for EIE is seldom taken I will advise individually.

EIE students doing allocated DoC projects should refer to DoC guidelines and web pages for all further project information.

Project Title Changes

After allocation it is normal for project titles to change as projects are scoped by students and supervisors. Occasionally titles will change again after this initial process when students meet supervisors. Often titles will change – to become more specific – towards the end of the project work when exact details are known. Title changes are allowed, but must be entered electronically into the system on the appropriate form by students or their supervisors. Students are responsible for ensuring that their project title is correct, and that any change made has agreement from the project supervisor. No changes may be made to the project title after the submission of a project abstract (see project dates).

Equipment

You are permitted to develop software or hardware on your own equipment, provided that you can duplicate it here in College for the demonstration day. However, you should prepare a fallback position in case your equipment misbehaves. Remember in particular that the software on some cheap home computers is not reliable. It is not unusual for a potentially good project to be spoilt by inadequate home equipment.

Please note that there is no excuse for failing to keep adequate backups on your home computer. If you lose your program or your data or your report because of a system failure you will simply lose marks. No extensions will be given at the end of the project for you to re-type a lost report, for example.

Meeting Your Supervisor

You must make sure that you arrange regular meetings with your project **supervisor**. The meetings may be brief once your project is under way but your supervisor needs to know that your work is progressing and you should be in contact once per week without fail even if this is only an e-mail. You should inform the supervisor of your college address and any changes to it, so that they can contact you, if necessary. If you need to talk to your supervisor between meetings and cannot locate him/her in their office, leave a note, or send e-mail, asking them to suggest a time when they will be available. When you go to see your supervisor (or second marker) you should have prepared a written list of points you wish to discuss. Take notes during the meeting so that you do not forget the advice you were given or the conclusions that were reached.

Meeting Your Second Marker

Every MEng student is assigned a **second marker** some time after the project commences and before your first deliverable – the Inception Report. The second marker will not necessarily know as much about the area of the project as your supervisor, but will always be a good person with whom to talk over your understanding of the project. You will normally meet your second marker for an interview to discuss the inception report, and be given non-technical feedback. Your final project mark will be agreed between supervisor and second marker, both of whom will read the final report. Therefore you should take the views of your second marker seriously. If you have any worries about the project which you do not think have been addressed by your supervisor you should in the first place arrange to meet your second marker. If this fails, or if for any reason you are unable within a reasonable time to contact either of your markers, you should inform the Project Coordinator who will take action as necessary.

BEng students have a shortened project timescale and no Inception Report. They will not normally meet their second marker until the project poster session.

Expenses and Component Purchase

No money is provided from the project budget for photocopying or printing. The BEng poster will be paid when College print service used: otherwise the normal allowance can be used for printing.

Most projects will require no expenditure, however a few, usually electronics design and build, will have significant hardware costs. Read Appendix 5 for the procedures to follow for hardware purchase. The intent is to make hardware use as easy as possible while having control over large expenditure and complying with the College Finance rules. These disallow some things that you might otherwise want, so read this carefully.

How to Get Help

Your project supervisor is first port of call once you have been allocated a project. For problems in the allocation process, or anything else that your supervisor cannot help, you should contact the Project Co-ordinator (t.clarke@ic.ac.uk).

It is very important that you receive timely guidance from your supervisor: and occasionally other commitments will prevent supervisors from being available for normal meetings. Normally supervisors will make appropriate arrangements whenever this happens. Should you have any problems communicating with your supervisor contact the Project Co-ordinator who will provide confidential advice and is empowered to remedy matters should this be necessary. Remember it is your responsibility to ensure that you have adequate (up to 1 hour per week if needed) supervision.

Online Resources

The Final Year Project Blackboard course has submission links and information for all project deliverables.

The intranet project web pages have forms and lists of projects, they may be viewed separately or accessed via the link in the Blackboard course.

Page 15 of this booklet contains some useful additional links.

Project Assessment

A good project involves a combination of sound background research, a solid implementation, or piece of theoretical work, and a well-structured and well presented report detailing the project's background, objectives and achievements. The very best projects successfully cover some new ground, e.g. by developing a new system which does not already exist, or by enhancing some existing system, application or method to improve its functionality, performance etc.

A completely straightforward implementation project is unlikely to gain first-class marks, regardless of how well it is done. Similarly, projects which are predominantly survey reports will not gain high marks unless they are backed up with experimentation, implementation, or theoretical analysis, e.g. for performing an objective comparison of the surveyed methods, techniques etc.

If you are looking to achieve high marks in your project and, particularly, if you are hoping to win one of the illustrious project prizes, you should choose your project with great care. Remember also that your attitude towards, and performance in, the individual project is taken very seriously by prospective employers and your progress is usually reported in some detail in academic references provided for you by staff members. Don't be afraid to discuss these issues with your prospective supervisor, or with the project co-ordinator.

The following components will be taken into consideration:

- **Background Preparation**. This component assesses the way you arrived at your initial project specification, work programme and list of objectives. It particularly addresses the background research undertaken and how your approach and programme of work fits in with the current state-of-the-art.

- **General Competence**. This assesses your overall approach to the project and your ability to overcome the inevitable complications which arise. The specific areas in which you will be assessed are management and organisation, reliability and punctuality, overall technical competence, and your individual contribution to the project.

- **Technical Achievement**. This assesses the main technical output from the project. It addresses specific issues such as the design, correctness, elegance, and usability etc. of the final product and the significance of the work in relation to the state-of-the-art.

- **Report and Presentation**. This assesses your ability to communicate your work and your findings to other people. The report is the single most important component of the project and you should invest a considerable amount of time in its preparation. You should read the `Final Report' section below to get a feel for what is required.

Grade Boundaries and Minimum Requirements

The grade boundaries set for individual projects are roughly in line with those of the overall degree programme that is approximately:

70% - I 60% - II/I 50% - II/II 40% - III

A mark of ≥50% (MEng) or ≥40% (BEng) is required to pass the project, and be awarded a degree.

Project Deliverables

The project has 4 deliverables. They are detailed in Table 1.

Deliverable	Weighting	Purpose
Interim Report	10%	Presents initial background research and/or early implementation results, and detailed project plan.
Abstract & updated title	0%	Project abstracts are required together with updated final project titles a few weeks before Final Report submission for preparation of a project handbook
Final Report	77.5%	Documents overall project results (includes background)
Presentation (MEng) or Poster (BEng)	12.5%	Presents project achievements and provides an opportunity for you to answer questions from your project markers.

Table 1 - Assessment

The Interim Report Milestone

Timely completion of the Interim Report with feedback from project supervisor incorporated is the sign of a healthy project that will be completed on time (see pitfalls below). You are expected to plan taking into account your individual commitments to other exams and coursework, and the time needed to obtain feedback from your supervisor.

The Interim Report is an important milestone in your project work and in addition to assessing the report your supervisor will provide you with feedback about how you are meeting the expected criteria in your overall project work. This feedback is in addition to the assessment of the report itself. The Interim Milestone Criteria are given on page 18.

The Interim Report should contain at least the following sections:

- Project specification
- Background
- Implementation
- Project Plan
- Evaluation Plan
- Ethical, Legal, and Safety Plan

The Project Specification should state clearly what the project is intended to deliver, including all hardware, software, simulation, and analytical work, and provide some motivation.

The Background section must outline the necessary background to the project, stating how it is important for the project work. For example: review of related literature, analysis of competing products, technical specifications of hardware or software standards, electronic components, necessary software tools, background theory. The contents of this section will vary for different projects, and in many cases the background reading will have been completed – but if not you should be in a position to list what remains to be done (e.g. a set of research papers to read and understand). A good benchmark of progress here is that you have accumulated and briefly considered (though may not need to read in detail) at least 30 references to background material. Your literature survey in the Interim Report will save time at the end of the project and allow this element of your final report to receive timely feedback from your supervisor so the final write-up can be improved.

The Implementation section details technical work completed. It need not be as comprehensive as the description you write for your final report and is intended to summarise your technical progress. In a few cases, where the project has very significant background, this section may be

omitted and a much longer Literature Review substituted.

The Project Plan is a preliminary breakdown of the work in the remainder of the project. You should identify a set of milestones and provide a realistic estimate of the time of each of these if all goes well, taking into account all your other commitments (modules, revision, exams). It will help your supervisor, and you, for you to estimate what fraction of your time each week, including vacations, you will be able to spend on project work. The project plan will also detail fallback positions in case any stage of the development goes wrong. In the early stages of your project work the times in this plan are guesses. However as the project progresses keeping track of and revising your initial estimates, and if necessary altering the proposed work, is a vital way to ensure that the project is finished in time.

The Evaluation Plan should detail how you expect to measure the success of the project. In particular it should document any tests that are required to ensure that the project deliverable(s) function correctly, together with (where appropriate) details of experiments required to evaluate the work with respect to other products or research results.

The Ethical, Legal and Safety Plan must detail what are the issues in this are relevant to your project, showing how you will comply with best practice. If there are no such issues (the case for 80% of all projects) you must nevertheless show here that you have considered these issues and detail why they will not apply to your project. Refer to information on the project web pages about Ethical, Legal and Safety matters.

The Interim Report Background and Implementation sections, together, should normally be between 10 and 40 pages long. The other sections normally comprise 5 pages. These lengths are guidelines and there is no penalty for deviating from them. Using Interim Report material, without explicit reference, in your Final Report is allowed and encouraged. The Interim Report is often a first draft of the background section of the Final Report. Reusing material, in this case, is not considered self-plagiarism, because it is expected that you will reuse Interim Report material without explicit reference.

The Abstract and Draft Report

Three weeks before the final report deadline you must generate an abstract and *a detailed report draft*. This is not separately marked but will be used by your supervisor to give you feedback on how to complete the report. Otherwise excellent projects can get low marks because a student has misunderstood the requirements (even though these are stated in great detail). Therefore you must submit a detailed draft which contains the *detailed contents and expected length* of each chapter of the final report, if not the final text. Discuss with your supervisor the exact timing and content of this so that you can get useful feedback. More work on the draft report is worthwhile because it will allow better feedback from your supervisor. Note that because this is not assessed you can with your supervisor's agreement depart from the normal timing.

The Final Report

The project final report has a separate and comprehensive guidance document which you will read in the Summer Term: it is your main deliverable on which most of the project marks rest. The summary here gives you a flavour of what you are now working towards.

The Final Report should demonstrate that:

- You understand the wider context of EE/EIE by relating your choice of project, and the approach you take, to existing products or research.

- You can apply the theoretical and practical techniques taught in the course to the problem you are addressing and that you understand their relevance to the wider world of EE/EIE.

- You are capable of objectively criticising your own work and making constructive suggestions for improvements or further work based on your experiences so far.

- As a professional engineer, you can document clearly and concisely your thinking and working processes for third parties who may not be experts in the field in which you are working.

With the exception of the project supervisor, the assessors will not have followed your project throughout and for this reason will rely heavily on the final report to judge the quality of your work. The same applies to the external examiners whose job it is to provide an opinion, heavily influenced by the individual project, to the exam board on class borderline candidates.

Many students underestimate the importance of the report and make the mistake of thinking that top marks can be achieved simply for working hard producing a good product. This is fundamentally not the case and many projects

have been graded well below their potential because of an indifferent or poor write-up. In order to get the balance right you should consider that the aim of the project is to produce a good report and that software, hardware, theory etc. that you developed during the project are merely a means to this end. Don't make the mistake of leaving the write-up to the last minute. Ideally you should produce the bulk of the report as you go along, and use the last week or two to bring all this together into a coherent document.

The physical layout and formatting of the report is also important, and yet is very often neglected. A tidy, well laid out, and consistently formatted document makes for easier reading and is suggestive of a careful and professional attitude towards its preparation.

Many students use Word to prepare the report, but an alternate recommended free document preparation software is the excellent TeXworks on Windows, which provides better automation of large-document production than Word. Whatever system you use make sure that you become familiar with it early on in the project so that final report preparation can be quick and without hitch. Discuss the merits of different systems with those who have used them early on in your project.

Remember that quantity does not automatically guarantee quality. A 150 page report is not twice as good as a 75-page one in the same way that a 10,000 line program is not twice as good as a 5,000 line one. Conciseness, clarity and elegance are invaluable qualities in report writing, just as they are in other aspects of engineering, and will be rewarded appropriately. The shortest prize-winning project report to date, for example, contained just 33 pages (of maths), although it is important to appreciate that the appropriate size and structure of a report can vary significantly from one project to the next. Typical length is from 50 – 150 pages. Detailed information can be found in the separate Final Report Structure and Contents document. A short summary of this is given below.

Title page. This should include the project title and your name. You can also list the name of your supervisor if you wish. You must use standard EEE cover page template.

Abstract The abstract is a very brief summary of the report's contents. It should be about half a page long. Somebody unfamiliar with your project should have a good idea of what it's about having read the abstract alone and will know whether it will be of interest to them.

Acknowledgements It is usual to thank those individuals who have provided particularly useful assistance, technical or otherwise, during your project.

Contents page This should list the main chapters and (sub)sections of your report. Choose self-explanatory chapter and section titles and use double spacing for clarity. If possible you should include page numbers indicating where each chapter/section begins. Try to avoid too many levels of subheading. Try if possible to stick to sections and subsections; sub-subsections are usually avoidable.

Introduction This is one of the most important components of the report. It should begin with a clear statement of what the project is about so that the nature and scope of the project can be understood by a lay reader**.**

Further information can be found in the separate Final Report Structure and Contents document.

Background The background section of the report should set the project into context by relating it to existing published work which you read at the start of the project when your approach and methods were being considered. The published work may be in the form of research papers, articles, text books, technical manuals, or even existing software or hardware of which you have had hands-on experience. Don't be afraid to acknowledge the sources of your inspiration; you are expected to have seen and thought about other people's ideas; your contribution will be putting them into practice in some other context. However, **you must avoid plagiarism**.

Body of report. The central part of the report usually consists of three or four chapters detailing the technical work undertaken during the project. The structure of these chapters is highly project dependent.

Further information can be found in the separate Final Report Structure and Contents document.

Conclusions and Future Work. All good projects conclude with an objective evaluation of the project's successes and failures and suggestions for future work which can take the project further. It is important to understand that there is no such thing as a perfect project. Even the very best pieces of work have their limitations and you are expected to provide a proper critical appraisal of what you have done. Your assessors are bound to spot the limitations of your work and you are expected to be able to do the same.

Further information can be found in the separate Final Report Structure and Contents document.

Bibliography This consists of a list of all the books, articles, manuals etc. used in the project and referred to in the report. You should provide enough information to allow the reader to find the source. You should give the full title and author and should state where it is published, including full issue number and date, and page numbers where necessary. In the case of a text book you should quote the name of the publisher as well as the author(s). The Bibliography should contain keys to allow specific references where appropriate. Use numeric [1] or AuthorDate [Cla06] keys. EndNote is a Word add-on provided by the College that will maintain Bibliographic references automatically, and BibTex a package that will work with TeXworks. Manual references are also fine although keeping these uptodate manually when writing a large document under time pressure is burdensome.

Appendix The appendices contain information that is peripheral to the main body of the report. Information typically included are things like program listings, complex circuit diagrams, tables, proofs, graphs or any other material which would break up the theme of the text if it appeared in situ. Large program listings may be submitted with the report although it is preferable either to provide them on CD, or to cite details of a suitable accessible cloud repository containing the material. Where CDs are used you must prepare two CDs, one for each paper copy of the report.

User Guide For projects which result in a new piece of software or hardware you should provide a proper user guide that contains easily understood instructions on how to use it. A particularly useful approach is to treat the user guide as a walk-through of a typical session, or set of sessions, which collectively display all the features of your product. Technical details of how the product works are rarely required here. Keep it concise and simple. The extensive use of diagrams illustrating the product in action usually proves particularly helpful. The user guide is often included as a chapter in the main body of the report, but can be included as an appendix to the main report.

Notes

The best way to appreciate the difference between a good report and a bad one is to look at reports from previous years. Some previous project write-ups are truly outstanding and you can learn a lot by looking through them in your spare time. The more recent reports can be found on the project web pages.

The Presentation (Meng)

Meng students will give a formal presentation late in the Summer Term after submission of the final report. You will be expected to present the broad area of your project and the background research that you have conducted, as well as your project achievements. It carries 12.5% of the total project marks, and normally supervisor & second marker with marking team will agree your project mark after hearing the presentation.

Beng students have no presentation, but instead an assessed poster session, in which your markers (and others) will ask you informally to explain your work with reference to a poster you have displayed.

Both presentation and poster sessions have a very similar format to what would be required in a research conference.

The Poster (Beng)

Beng students have approximately 5 days after submitting their report to prepare an A2 sized colour poster that will be professionally printed and laminated. The College provides a service for this but a faster turnaround can often be found elsewhere. During a scheduled poster session project assessors and others will view the poster and ask questions. Students should be prepared to give a general description of the project but be aware that in poster sessions staff often will ask specific questions and not ask for a general exposition.

Pitfalls

Some of the most useful things to know about individual projects are the common pitfalls. Why do some projects go horribly wrong? Here are some of the common causes of failure:

Choosing or starting the project too late. Submit your project request form on time and start the project as soon as you can. The longer you leave it the harder it is to get motivated, especially when all your friends seem to be flying ahead. You should aim to have completed a substantial part of the project by the end of the Spring term.

Spending too much time on non-project examinable coursework. The coursework demands from lectures can eat into your project time. It is your responsibility to make sure that this does not happen, and plan around any possible conflicts. It is not possible to do justice to a final year project unless you are working continuously (though part time) for at least 20 weeks before your exams. Consider this when registering for more than the minimum number of lecture courses, and when determining loading

Failing to meet your supervisor regularly. If you arrange a meeting with your supervisor, turn up at the agreed time. If you are stuck for any reason and you have no meeting arranged, contact him or her immediately. You gain no sympathy from anyone if you lose contact with your supervisor and produce a poor project as a result. Your supervisor will be happy to help you but they can do nothing if they are unaware that you are having trouble. Note that regular meetings with a supervisor are a requirement of the project and you, not your supervisor, are responsible for ensuring that this happens. If your supervisor is not able to meet you regularly you should let me know immediately.

The most common cause of project failure is for a student faced with a difficult project who has made little progress before exams to fail to meet supervisor immediately after exams. The long period of full-time work after exams is enough to re-scope and complete otherwise failing projects, but this will not happen unless you inform your supervisor of problems and get started immediately after exams.

Relying on inadequate home equipment. You are not encouraged to use home equipment, but if it is absolutely necessary you should maintain strict regular contact with your supervisor even though you may prefer to go home and work on your project.

Allowing too little time for the report. You should try to produce as much of your final report as you can as you go along, even though you don't know in advance its exact structure. The last two weeks of the project should be dedicated to pulling together the material you have accumulated and producing a polished final product.

Failing to plan a fall-back position if the planned work is not completed on time. Try to plan your project in stages so that if things go wrong in a later stage you have a completed stage to fall back on.

Trying to satisfy an external customer at the expense of your grades. Do not let any outside interests interfere with your work. The guidance for your project should come from your supervisor, not your prospective employer.

Over/Under Ambition. Try to be realistic about what you can achieve in the time available. A good project requires a lot of input from you and should prove to be technically challenging throughout. At the same time, however, it is better to do a small job well than it is to fail to do a big job at all. Your supervisor will advise you on his or her expectations of the project and this will help you to set your sights accordingly. Don't be afraid to adjust expectations up or down throughout the project.

As important as the project is, however, do not let it interfere with your exam revision. You should normally plan not to spend much time on your project between the end of the Spring term and your last examination.

Formal Requirements

This section should be read carefully by all project students. Because projects comprise a major part of the year's mark, and the largest single assessed component of your degree, procedures are formally defined and must be followed. You need to understand these in order to know how best to act should you run into trouble during your project.

Plagiarism

As in all other coursework, plagiarism is viewed particularly seriously by the University and **we implement automatic electronic measures to detect plagiarism** in any of your written work, as well as being vigilant when marking reports. If plagiarism is detected the matter will be dealt with at a University level, past history shows that offenders usually fail their project and hence degree, and excuses are not allowed. So make sure that you do not plagiarise, even inadvertently. The golden rule is that material, whether tabular, pictorial, or textual, quoted from other sources must be acknowledged explicitly in your project report – whether the source is another student, a textbook, or some on-line report. If in doubt about this consult your supervisor. You will incidentally find that having a comprehensive list of references strengthens your report.

Logbook

You are expected to keep a paper or electronic logbook documenting your project work. In case of suspected plagiarism you will be required to submit this as evidence.

Your supervisor is the most important resource for you during your project work. Lack of contact with, or communication with, supervisors when projects are going wrong is the also the most common cause of project failure.

Although supervisors will not normally give you more than one hour per week of their time regular meetings with your supervisor or a proxy agreed with him/her are mandatory. **Meetings must be held at least every 2 weeks during Term**. The only exception to this is if you have made an e-mail progress report to your supervisor and received from him an e-mail statement that a meeting is under the

circumstances not necessary. Such an exchange, will be accepted in lieu of a meeting. Any gaps in this record will be deemed to be your fault. In the case that your supervisor cannot be contacted (e.g. is not available for meetings and will not answer e-mails) you must contact the Project Co-ordinator who will resolve the situation.

Project meetings, or e-mail exchanges in lieu of meetings, must be noted in your project logbook (you do not need to include the e-mail message, but must note the date and summarise content if you do not). Breaks in project work, for exams or illness, must be recorded. Your logbook may be inspected at any time and unexplained gaps may result in the loss of project marks.

Late Deliverables

A deliverable which is late in industry can have very serious consequences, and an important part of project management is the ability to complete work on time – even if this means late revision of project plans. Your assessed project reports (Interim and Final) must be submitted electronically on time. Late submission without valid mitigating circumstances submitted to the Senior Tutor will lead to a 0% mark. Project supervisors are not permitted to change project deliverable deadlines. If you do not attend your project presentation you will also normally lose all marks associated with this. As always, Mitigating Circumstances for late submission can be applied for from the Senior Tutor.

See Blackboard for submission guidelines for project reports.

Unforeseen Circumstances

If events outside your control (for example an illness in the late stages of the project) prevent you from making the expected progress on your project you must inform your supervisor and the Senior Tutor at the first available opportunity. You will probably need to fill in the on-line mitigating circumstances form available under quick links in: http://www3.imperial.ac.uk/electricalengineering /teaching/undergraduate. It is your responsibility to ensure that the department is properly informed on mitigating circumstances. In the case of doubt contact the Senior Tutor

Useful Links

Table 2 shows some useful links. Note that the project web pages contain an on-line version of this guide and may be regarded as definitive – any error or changes in the paper version will be corrected on the web pages. Deliverable submission information etc can be found on the Blackboard course.

https://intranet.ee.ic.ac.uk/t.clarke/projects/	
	The **project web pages** are your reference for dynamic information about projects (project lists etc) and forms to enter required information.
http://www.imperial.ac.uk/electrical-engineering/internal/stores/	
	Stores web page with links to electronic online catalogues and ordering. Read this and go see stores on level 1 for more info.
http://www3.imperial.ac.uk/ict/services/software/	
	Page detailing software available from College ICT. Some of this is free for students, and some has special rates for students.

Table 2 – Useful Links

Project Dates

	MEng	BEng
Staff Project lists complete	Monday 9/10/2023 Week 2, Autumn	Monday, 9/10/2023 Week 1, Autumn
Project selection complete	Thursday 26/10/2023, 14:00 Week 4, Autumn	Friday 26/10/2022 14:00 Week 4, Autumn
Projects allocated	Week 5, Autumn	Week 5, Autumn
Lecture on Plagiarism and conducting a Literature Survey	See Term Timetable	
Interim Report	Monday, 23/1/2024 16:00 Week 3, Spring	Friday, 3/5/2024 16:00 Week 1, Summer
Abstract and draft report	Monday, 27/5/2024 16:00 Week 5, Summer	Monday, 3/6/2024 16:00 Week 6, Summer
Final Report	Friday 14/6/2023 16:00 Third last week, Summer	Friday 21/6/2023 16:00 Second last week, Summer
Presentations or Posters	Monday-Thursday, 24,25,26,27/6/2024 Last week, Summer	Thursday 27/6/2024 Last week, Summer

Table 3 – Project Dates

Appendix 1: Self-proposed & Industrial final-year projects

Tom Clarke, Project Coordinator, t.clarke@ic.ac.uk

The Department welcomes student proposals for project work, particularly if they originate from an industrial contact.

Self-proposed projects

Follow this procedure if you have an idea that you think would make a good project.

Students wishing to propose their own final-year projects should ideally discuss the idea as soon as possible with a staff member whom they think might be interested, or with me. In most cases completing a provisional proposal as below and sending it to me with comments is a good way to get started. I'll respond with comments and initial opinion on suitability.

They should then write a project proposal of 200-500 words giving the following information:

(i) Objective of the project.

(ii) Any industrial background, including the name of anyone outside the College assisting with or interested in the work. The Department will normally make contact with this person.

(iii) An outline of the proposed method with mention of any special apparatus needed.

(iv) A rough timetable for the project including some intermediate milestones.

(v) An estimate of the cost of the project and if any external source of funding is available. There is no fixed project budget: projects are funded on basis of need and value to project.

(vi) The name of any member of staff with whom they have discussed the project, and whether they would be willing to supervise. Note that the final allocation of a supervisor is the responsibility of the project coordinator, and may not be the person with whom you have discussed the project.

The proposal should be submitted to me **as early as possible**. The latest date for the submission of a draft proposal will normally be the deadline for project selection completion (see project dates), however it helps to be early because often proposals need some modification before they can be accepted. It is usually essential to discuss proposals with a staff member who is knowledgeable in the field of work to ensure that a good proposal is prepared: electronic design and make projects normally make straightforward self-proposed projects and can always be discussed with me. They will often be accepted immediately.

After I have seen a draft proposal I may suggest changes necessary before the project can be accepted. Several iterations are often necessary, so please allow time for this process when making a project proposal. You will normally need to take part in project selection so that in the very possible case your self-proposed project is not agreed you have another option.

Acceptability of proposals is judged by several criteria. Projects must be relevant to the course of study and be of a standard commensurate with third-year or fourth year work. The timetable must be realistic. There must be no unreliable element in the schedule such as an uncertain delivery

date. Provision must be made for any special equipment. Most of the work must be carried out on College premises.

Industrial Project Proposals

If you can define the project yourself, with the help of a possible industrial supervisor, then follow the procedure above, making sure that you enclose contact details for the proposed industrial supervisor. It can take some time to determine whether an industrial project is suitable, so make sure if possible that you let us know in good time before the start of the Autumn Term.

If you have an industrial contact who wishes to discuss possible projects with me directly before helping you to define a project, then give him or her a copy of this document, and my contact details. The same criteria will be used when evaluating the project as for self-proposed projects.

IP and Confidentiality

Supervisors will normally be willing to sign NDA agreements where required. The department can ensure that projects are not publicised, however assessment mandates a presentation in front of a mark team of approximately 4 staff, 12 students, and External Examiners have the right to see any project report or presentation, and will sometimes exercise this.

IP is not normally considered an issue in Undergraduate Projects, and IP agreements are not signed. Where IP results from student or supervisor input the College rules apply which apportion IP fairly according to input, and mean that typically students own IP of their work:
https://www.imperial.ac.uk/research-and-innovation/research-office/ip/ip-policy/

Timescale

The following table gives a very approximate guide to the number of full time equivalent days work in a project, and its timing. The work before exams will depend on student workload on exam courses and associated coursework, this is very variable. Some students will add to these figures by doing significant work during vacations.

Period	Meng	Beng
Autumn Term	10.5 days	0 days
Spring Term	19.5 days	5 days
Summer Term	30 days	45 days
Total	60 days	50 days

Projects start from the beginning of the Autumn Term (Meng) or mid Spring Term (Beng) and continue until the last week of the following Summer Term.

Appendix 2: Interim Milestone Project Criteria

These criteria will be judged by the supervisor on the basis of the Interim Report, and any other written material you have handed in, together with your performance at project meetings prior to the Interim Milestone. Project students are expected to have achieved all these criteria by the time of the Interim Milestone.

How to achieve each of the criteria will form a useful conversation with your supervisor throughout the initial stages of the project: you can ask whether what you do meets this or if not how to improve. Maybe at the start some seem far removed from what you are doing. Ask your supervisor what is a realistic timescale within which you can achieve them.

Project work is more open-ended than other kinds of work and this is both exciting and (sometimes) scary. The key to success is to take control of your own work, and also seek appropriate help and advice from others, especially your supervisor. Working independently and seeking help may seem contradictory: in fact they are both essential elements in success.

Criteria

The student has worked independently to define and solve technical problems	Your supervisor will help you: and also tell you what aspects of the work you are expected to do might fulfil this. Getting started on technical work early in a project is important to reduce risks, and inform the Interim Report.
The student has located and researched project background material	Your supervisor will always provide advice and often specific reading to get you started. You are expected to find your own additional material as necessary, and can always check with your supervisor if not sure whether you are spending too much time on irrelevant background.
The student has written a critical review of an appropriate part of the background material	The nature of the review will depend on the project. Writing critically shows that you understand how the background material relates to the project problem. Even in some projects with very complex background you will have completed a significant part of this process at the Interim Milestone, and the work will (with some possible rewriting) form part of your Final Report.
The student has been self-propelled	The key to this is that you take control of all of the organisation necessary to work on the project efficiently: informing your supervisor of progress, or problems, arranging regular meetings, forming targets for future work, planning the project at an appropriate level of detail.
The student has demonstrated a clear understanding of the expected project deliverables	Part of the initial phase of the project work is getting to grips with the project requirements and formulating deliverables which are achievable. You should understand, in outline, the work needed to achieve deliverables, and the uncertainties.
The student has made appropriate use of help from other people	The above five requirements are what would be required in industrial work. As in industry, you are expected to seek help from others. Your supervisor is primarily there to help you achieve them. He/she will provide technical advice, and also, if asked, discuss project deliverables, provide feedback on whether you understand them, etc. There will be other people who can help: lab technicians, PhD students, etc. Part of learning to work efficiently is being able to find out who can help and ask. You will find that when asked specific questions almost everyone is willing to help, or recommend who else might do so.

Appendix 3 Resources for Hardware Projects

- Come and see Ed Stott for a chat. You can drop in to see him in room 612 or make an appointment by email. He can consult on technical queries and advise you on what facilities are available in the department.

- Talk to Vic Boddy in the Level 1 Lab. Vic can give you a bench to work on your project and lend equipment. He is also an excellent hands-on engineer and a soldering expert.

- Seek help from other students. The Imperial College Robotics Society (ICRS) is based in room 506 next to the final year project benches and among them they have a vast amount of collective experience. You will find ICRS members in the lab most of the time but try going along on Wednesday afternoons when they'll be working together on a variety of projects. Don't be afraid to ask anyone in ICRS for help – the society's main objective is to share information and experience.

- Join the Imperial College Advanced Hackspace (ICAH). ICAH provides many resources for project builders across the college, including equipment and guidance. See their website for full details: https://icah.org.uk/

- Take an internal course. ICRS and ICAH run a number of courses throughout the year. Of particular interest might be the PCB design and CAD courses. These will advertised when they are available to book.

Appendix 4. Imperial College Online Software Training

The College provides excellent Matlab online training courses, and links to good Python training, for those needing to use these languages, see the project web page link:

https://intranet.ee.ic.ac.uk/t.clarke/projects/general/Tutorials/learning.htm

Otherwise see your supervisor for appropriate online help.

Appendix 5. Procedure to Follow for Hardware and Equipment Purchase

FYP's operate a budget model different from group projects. There is no fixed project budget, and in fact most projects will spend nothing since the necessary equipment and facilities are available and the project does not require hardware. Where projects *require* hardware (or, in unusual cases, software not available from College) there is no set limit to expense, and we try to ensure that students can quickly and efficiently order necessary components for successful project completion. There are a few gotchas in this process (mostly relating to College Finance rules). The most common source of friction is that thus far College is unable (without exceptional permission) to allow you to order from internet-only suppliers such as Amazon. Also where a project requires **very high** expenditure (order > £200) this may not be deemed appropriate and you are advised to get this authorised in principle at the start of your project work, or as soon as it becomes clear that it may be needed.

Here is a flowchart for the [ordering and authorisation procedure](). The flowchart has associated help (click on boxes). The points below provide some context.

- Electronic components & equipment less than £100 per single order can be ordered direct from normal suppliers (RS, Farnell etc) without using the online form.
- PCB purchase. Please plan PCB designs well in advance of when you need the PCB, and check suppliers and whether costs are justified with Ed Stott.
- For any individual item costing more than £100 you require authorisation by e-mail: **I will expect that if possible you obtain authorisation in principle for such expenditure well before you actually need to spend the money.** If possible order components from RS, Farnell or another standard supplier as used by Level 1 stores, see the staff in stores for more information.
- Specialised equipment for research-oriented projects may come direct from your supervisor.
- In exceptional cases, where a project depends on equipment which can only be ordered from a non-approved supplier, please follow the [flowchart]() to gte this authorised