BEng/MEng (EEE, EES, EDS) (2022/2023)

19.496 INDIVIDUAL PROJECT: ADMINISTRATIVE ARRANGEMENTS

This document provides information regarding administrative arrangements for the individual projects undertaken by fourth-year students of the MEng/BEng degree in Electronic & Electrical Engineering, Digital Communications & Multimedia Systems, Electronic & Digital Systems, Electrical Energy Systems

ORGANISATION

All 4th year EEE/EES/EDS/DCMS BEng/MEng students are required to undertake the 19.496 project. Students choose their project topics from a list provided by the department or, with consultation, specify their own topic. EEE Staff, for the purposes of undergraduate projects, are associated with a project team or domain. This simply aids the management and administration of project work. Students are not restricted to working within specific groups as many projects and supervisors cross domains. The current project domains are defined as Ultrasonic Engineering (CUE), Optoelectronics, Communications (Comms), Digital Signal Processing (DSP), Control, Advanced Electrical Technologies (AET), Energy and Instrumentation Systems (EIS), Advanced Energy Systems (AES), Wind Energy Systems, Power and Energy Systems..

All project descriptors are made available on the EEE department's project database: http://www.eng.strath.ac.uk/intranet/studentprojects/ and students are required to select their desired projects using the e-system. Details of the selection and allocation processes – including own project specification are described on myplace. Allocation of projects will be done by middle of week 1 in semester 1 and project work starts week 2.

Dr David Harle is Course Director of the EEE/EES/EDS degree streams and is also responsible for organisation of these projects. If you have specific queries or experience administrative problems during the year, then please contact him directly. If the technical work itself does not proceed well, then discuss with your principal supervisor in the first instance. If progress remains unsatisfactory (for whatever reason), then discuss with your personal counsellor and/or Dr Harle as appropriate.

This project is the most important activity within your entire degree course and will strongly affect classification and award of your degree. Therefore, act immediately if you experience any difficulties in maintaining satisfactory progress.

ASSESSMENT

There are five components of assessment, described in detail in the separate assessment schedule. Each component of assessment contributes a specified maximum percentage towards the total mark for the individual project:

- Interim assessment (20%)
- Poster presentation (10%)
- Final report (40%)
- Conduct of project work (15%)
- Overall Technical achievement (15%)

The final component of assessment is intended to measure *overall* success of your project in terms of *understanding*, *effort* and *achievement*. These criteria, of course, are those which will later be applied during your own professional career.

The project is allocated 40 credits and this value indicates the ***substantial*** amount of time and effort which is expected. Students are expected to spend 1/3 of their time working on their project and this is equivalent to 400 hours of total effort.

For BEng students, the final degree is based upon an aggregate mark derived from 30% from the Credit weighted Average (CWA)[1] from year 3 and 70% of a CWA from year 4. The project represents 1/3 of the year 4 CWA and thus contributes 21% towards your final award.

[1] The CWA is obtained from formal first attempts at any assessed module in year 3 and 4 respectively.

For MEng students, *all* classes during the final two years contribute *equally* towards award of the degree, with each class weighted according to its actual credit value.

SUPERVISOR

All project students will be assigned a project supervisor. The role of the supervisor is to mentor, guide, monitor and assess progress and achievements during the course of the project. The project work should be driven, primarily, by the student although the supervisor will play a role (generally in the initial stages) in **helping** to specify and define the project aims and objectives.

Students are required to meet regularly with their supervisor during the course of the projects. The exact frequency and duration of project meeting depends upon the student, supervisor and the nature of the project but there is an expectation that student/supervisor interaction is equivalent to around six 1-hour meetings per semester. These meetings may be in person and via Student conduct is being assessed throughout the project and project meetings are a key part of this assessment. Students should prepare for these meetings and arrive promptly with their logbook and other required material. Students and supervisors should ensure that formal meetings are planned in advance and, indeed, it is appropriate to always arrange the date of the next meeting during the current meeting. After the meeting (as well as during), students should make notes and summarise the outcomes and actions that result. Students must endeavour not to miss meetings with their supervisor; lack of interaction with the supervisor will impact the assessment of project conduct. If a meeting cancellation is unavoidable, then the student must communicate with the supervisor at the earliest possible time (ideally in advance) to reschedule the meeting.

Students should realise that although project supervisors endeavour to support and guide students throughout their projects, the responsibility for progress and achievement lies with the individual student.

SECOND ASSESSOR

The two written reports (interim and final) from each project student will be assessed by two *separate* members of academic staff. Therefore, in addition to your principal supervisor (allocated at the start of the project), another member of staff will subsequently be designated as "second assessor". Normally this will be another staff member working in the same department and research area.

You will be allocated a 2nd assessor at some point during the 2nd semester; possibly before. The 2nd assessor will primarily contribute to the assessment of the final report and overall project contribution.

The function of the second assessor is formally limited to assessment; they are an informed and independent actor in the assessment process and do not take an active role in project supervision. You may, by agreement have project support provided by other research or academic staff with your supervisor's working team. However, the assigned supervisor remains responsible for overall and formal supervision of the project and for monitoring and encouraging progress.

STATEMENT OF INTENT (SoI)

You are required at an early stage (around end of week 4) to submit a "statement of intent". Although not directly assessed, this document serves several purposes:

- Preparation encourages communication between student and supervisor during the critical early stage of project definition.

- A provisional title of the project should be specified. This title should not be changed from that originally listed unless nature of the work has been substantially revised:

- Three related sections are entitled "Project description", "Objectives" and "Plan". Together, these ensure that the student has established clear scope of work for the entire project and that corresponding outcomes have been agreed with the principal supervisor. These objectives may well be rather different from the emphasis of the project description which was issued when projects were allocated. In particular, objectives – as defined now – should be realistically achievable by an undergraduate student within the available timescale.

- Necessary resources are identified and it has been arranged for these to be available at the appropriate stage of the programme. Such resources might include accommodation, workshop facilities, special equipment or components, access to computers and specialist software as well as various types of information.

- The student must indicate awareness of and compliance with Area Safety Regulations of the relevant department. The principal supervisor must identify, in writing, any safety precautions additional to normal departmental requirements.

- Identification of Technical Risk. This is an essential part of all project planning and it is imperative that technical risk is assessed during the planning process in order that appropriate mitigation strategies can be implemented. (Perhaps consider wise to consider impact COVID induced disruption – reflecting on experience of the past few years.)
- Other matters that will need to be consider include sustainability issues, ethics requirements alongside data storage and integrity matters and cyber security

A clear statement of objectives now is essential if the project is to be properly managed; indeed it is these objectives which will be used to assess the extent to which the overall project has been successful in due course. Although short (typically 250 words), this statement must indicate *exactly* what the student intends *personally* to *achieve*; it is not necessary to indicate in any detail how technical problems will actually be solved.

The student is responsible for the production statement but the principal supervisor also signs to indicate that objectives are sufficiently demanding for an undergraduate project and yet realistically achievable. The SoI will be submitted via myplace and copies retained for reference in interim and final assessments.

It is fully understood that project aims objectives and thus plans may be subject to change as things progress. Such changes occur for a variety of reasons and are viewed as a natural part of the project process. The critical role played by the SoI is to provide a 1st pass at setting aims, objectives, plans and identifying risks and resources and then being used as reference to identify and record when the inevitable changes will occur.

LOGBOOK

Any project must be supported by appropriate routine documentation which is maintained systematically as work proceeds. Customarily a bound book is used as master document and this is usually referred to as a logbook (alternatively described as a log report). This document then serves as a chronological record of work and can also be employed to specify short-term objectives and thereby monitor progress.

You should discuss with your supervisor the format of logbook and its contents. You **must** maintain routine records of all activities and progress in some appropriate format. This written documentation should be shown to your supervisor during your regular meetings throughout the project; it is recommended that the supervisor signs and dates the logbook after each meeting. Because of its importance, some assessment is associated directly with adequacy of your logbook and other routine documentation.

The traditional format for a logbook is a hard-backed bound A4 book and this is still the recommended and preferred option. There are alternative mechanisms that can be used to store such records electronically. The recommended alternative is the use of a University supported* shared drive that is directly accessible by students and supervisor – Strathcloud and/or OneDrive being ideal for such a purpose.(* use of UoS supported system mitigates any security issues, has ease of use and also provides a form of back-up.) Record keeping and progress recording is a critical part of project work and thus forms part of the assessment process. Regardless of mode of recording students will be required to submit evidence of their record keeping for review by assessors. Record keeping must be an ongoing part of the project process and not simply an afterthought.

You will find that the final report will be difficult to prepare if you have not prepared summary documentation throughout the year. Whenever some task is complete, then you should attempt then (not later) to write a clear description of work and its outcome. Ideally, the final report will require you only to consolidate written information which already exists.

INTERIM ASSESSMENT

The EM401 interim assessment is worth 20% of the overall project mark and comprises a written project status report and an oral examination.

Project Status Report

Prior to the Christmas break each student is required to upload to MyPlace a status report of their project, the main body of the document should be a maximum of 4 pages in length and should detail the following:

The motivation for the study, this ought to encompass the technical; societal; and potential financial benefit that could arise from the project outcomes. A review of the most pertinent pieces of prior art relating to the project should be summarized, in particular encompassing the technical aspects of the project. This highlights that student has reviewed in detail the foregoing literature, and has made an attempt to place their work in context with the state-of-the-art. This technical description will also serve to show that the technical risk has been considered. These sections should extend to no more than 2 pages of the submitted document.

Project Plan - One page of the submission should be a Gantt chart of the project plan, ideally landscape page orientation. The plan should encompass all activities across both semesters, with milestones relating the project objectives clearly indicated, expanding on the objectives established in the earlier statement of intent. Activities that have been completed should be indicated as such on the chart, if applicable any revisions that took place in completing those original objectives should be noted on the chart and further described in the accompanying text.

The Gantt chart should be accompanied with 1 page of text, wherein the student should describe in detail each of the activities that will be undertaken during Semester 2; what are the key milestones and decision points in the plan; the lead times of any major purchases or manufacturing stages should also be highlighted. Some reference to the techniques and methodologies from the background literature that appears in the foregoing sections is to be expected. In addition, some commentary on the key technical risks in completing the project should be included, along with any mitigation that has been considered to reduce/limit/eradicate said risk.

These 4 pages are to be accompanied with additional pages detailing the bibliography of literature that has been assembled and described within the report.

The submitted document will form the basis of the oral examination that will take place in Week zero of semester 2.

Oral Examination

During Week 0 of Semester 2, each student will attend an oral examination with two members of academic staff, the meeting will last no more than 20 minutes. The focus of the meeting will be assessment of the following: project progress to date; record keeping as evidenced in the project logbook; thoroughness of background research; understanding of the wider context of the work; technical knowledge and understanding; thoroughness of the project planning and attention to technical risk.

Students must attend the oral examination with their up-to-date project logbook as this, along with the 4 page project summary submitted at the end of Semester 1, will be focus of the examination. At the end of the oral examination students will receive feedback from the examiners in attendance via the 19496 MyPlace page. In some circumstances, specific focused feedback will be provided via the project supervisory team.

Students are expected to have returned to the University for this week and be available to give the presentations. Failure to attend or be available for the allocated presentation slot will result in a 0/10 grade for the presentation.

POSTER PRESENTATION

Poster presentations will be held on the same day for all project students taking courses associated with the Department of Electronic and Electrical Engineering.

Detailed arrangements will be specified later, but the date will be during week 11 of semester 2 of the second semester. Students are expected to submit their poster at the very start of week 11 and should plan accordingly. The planned submission date for the poster is Monday of week 11 of semester 2.

FINAL REPORT

It can be a temptation to leave writing of the final report until toward the end of the project, focussing on completing objectives and deliverables at the expense of write up such that not enough time is devoted to making a good job of the reporting. This is a common mistake, 40% of the project mark is allocated to the final report and so it should be given the level of attention and effort associated to its importance to the assessment schedule. Writing should be a continual activity for the duration of the project with sections of the report being written concurrent to the completion of the associated project activity. Keeping the report as a continual focus throughout the duration of the project allows you to keep track of the overall narrative and structure of the document and keep on top of references, experimental data etc. and their significance to the project.

The final report must be submitted no later than the end of week 11 of second semester (actual date/time will be confirmed in due course via MyPlace). A late penalty whereby any report submitted after the deadline (either paper or e-copy) will be awarded 0 marks. This is formal faculty policy and students should not seek to request extensions to the submission deadline; all requests will be denied. A student who does submit after the deadline must provide appropriate mitigating circumstances and corroboration to the University via Pegasus. The report will be read and graded but a mark of 0 will be returned. It will be up to the examination board to determine whether the late penalty can be rescinded or not. Please note the implications of such a grade for the report. Both versions must be submitted by the deadline to avoid such a penalty being applied.

The 19496 project is a sustained piece of work whereby students are expected to work on the project throughout the semester 1 and 2. Part of the assesment of the project is the ability to deliver a body of work within a given deadline. Students should have, well in advance of the final deadline, started preparing their final report and have discussed this with their supervisor. The production of the report in a timely manner is a key aspect of the project planning and delivery. Students are have expected to start preparing their report well in advance of the deadline and from week 9 onwards be able to provide draft copies of their report for review. Such drafts are obviously “work in progress” and will be added to and revised as the final deadline approaches. If a student has a credible reason (in line with University policy) that impacts ability to submit a “final” report at the given deadline, then the student is expected to submit their most recent version by the given deadline (week 11 Semester 2). Any further later submission can be dealt with under the appropriate University policies. The submission that will be assessed will be the one advised by the University’s Mitigating Circumstances and Late Submission policies. Students will be requested to submit a draft copy of their final report no less than 7 working days from final deadline – purely as contingency and to highlight any issues in advance. The draft submission will of course be superseded in time by the final submission made by the student.

The assessment schedule, in conjunction with EEE guidance, indicates those aspects of this written document which are most important. Length of written text should normally be in the range from 10000 to 15000 words (approximately 35 to 50 pages), but the complete report may be longer because of graphical and other information.

Note that the final report must also include the following components:

- standard declaration (immediately inside front cover),

  “I hereby declare that this work has not been submitted for any other degree/course at this University or any other institution and that, except where reference is made to the work of other authors, the material presented is original and entirely the result of my own work at the University of Strathclyde under the supervision of .. *insert supervisor’s name****.”***

- summary/abstract (about 200 words on a single page, after declaration)

An electronic copy of the reports must also be submitted by the agreed deadline. Like the interim report, the submission will be achieved via TurnItIn – instructions to follow.

FORMAT OF FINAL REPORT

Standard format and covers (coloured card – front and rear) for both interim and final reports will be required; details will be provided separately. Prepare these covers immediately before submitting each of these reports. Specified details of your own project are added to the standard front cover.

Both reports must be prepared with an appropriate word processor and you will be penalised if spelling and grammatical mistakes have not been eliminated. A proportionally-spaced san serif font, similar to Helvetica or Arial, should be employed in 12/11-point size. There should be either one-half or a full blank line between each line of text (line spacing equals 1.5 or 2) to permit subscripts and superscripts.

Typescript and figures must be supplied on only one side of the page. Pages must be numbered consecutively centred at bottom (within specified margin). Chapters and sections of text should employ the decimal system: for example, a sub-section might be numbered "1.2.3".

All figures and tables must be numbered consecutively and also allocated a descriptive title. You may choose either to incorporate figures and tables into the text where first cited or to consolidate all such material at the end of each chapter or the complete report. That decision may depend on capabilities of your word processor but you should also consider the nature of your own report and convenience of the reader.

Paper must be standard A4 size (210 × 297 mm). All margins must be 25 mm except left margin which is increased to 40 mm to permit binding; this binding can be undertaken at EEE Resource Centre (Royal College Building, room R4.01).

Both reports should include a contents list with section and page numbers. Contents should also itemise all other material such as figures, tables and other graphical information as well as any appendices. More detailed guidance about report writing will be available on Myplace in due course.

CURRICULUM VITAE

During the 1st semester, students are also encouraged to submit their curriculum vitae for review by their supervisor. This is not a formal part of project assessment but your supervisor will give advice on how your content and presentation might be improved. This should be done in sufficient time to allow meaningful feedback to be provided BEFORE applying for postgraduate course, graduate trainee schemes and graduate jobs. Furthermore, it is very likely that your project supervisor will be asked to act as your referee and seeing your CV and advising on contents also helps any referee provide informed and personalised references.

The reason for this requirement is to encourage students to develop their curriculum vitae as an effective professional tool, needed when seeking employment or other career changes.

In addition to personal details such as name and address, your curriculum vitae should include details of your academic activities at school, university and elsewhere. Personal and social interests are important also as well as career intentions and experience of relevant and other employment. Basically you are attempting to "sell" yourself by describing your professional ability and personal skills. Careers sessions at the start of semester 1 will provide further advice on preparation of your curriculum vitae.

INFORMATION FOR GUIDANCE

In general, your reports and oral presentation should emphasise *interdisciplinary* and *original* aspects of your project since it is being undertaken as a major component of an honours degree. Your supervisor will provide further guidance regarding any special requirements of your own project and will probably wish to comment on the initial draft of your final report. Supervisors will not review or correct either the interim or final reports; it is the student's responsibility to produce an acceptable report by the deadline set. Students will be given formal feedback from the interim report and this feedback should be used to inform and improve the final report.

Remember, however, that your project is unique and so you yourself must judge how best to present content and structure of your own work. Projects will vary considerably in their balance between disciplines; different engineering activities such as theory, experiment, analysis, design and simulation may be required.

The assessment schedule is described in terms of those aspects of professional competence which all projects are likely to require.

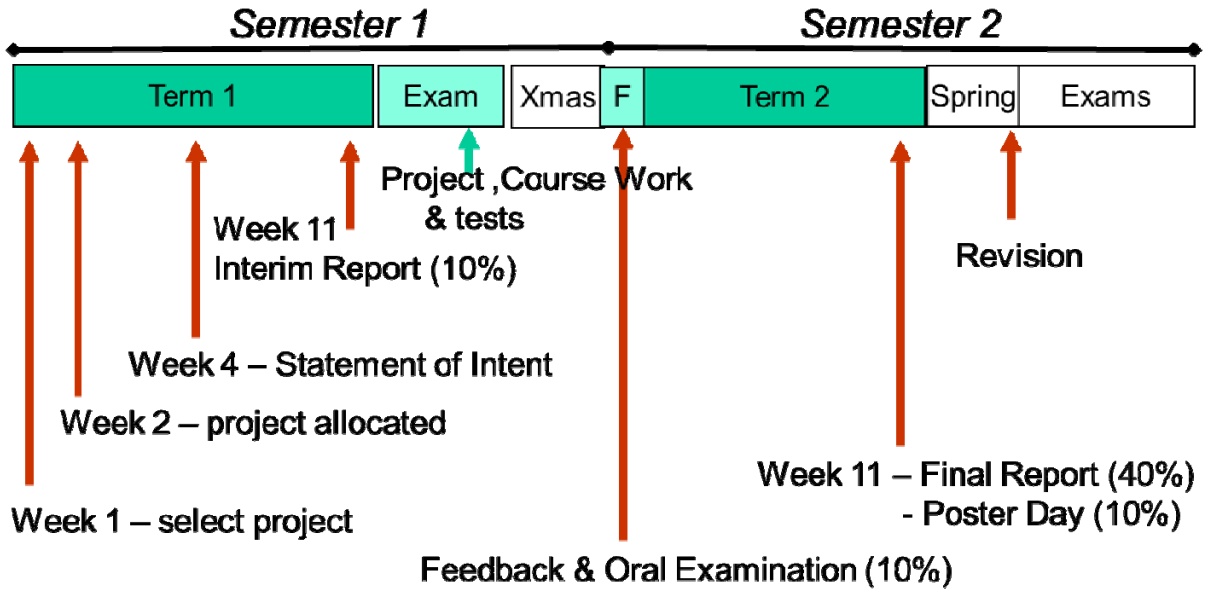
The general technical level of your report should consider two categories of reader. Firstly, your second supervisor is a typical professional engineer but probably not aware of all activities and technical detail associated with your project. Secondly, prepare the report such that it would be useful to another project student, perhaps continuing some aspect of the same work. Assume general competence in the two engineering disciplines but include all information and ideas which would not be familiar to another student entering the final years of a degree course.

During the year, you should observe the style of writing conventionally adopted by professional papers and reports. You will certainly find it useful to read one of the many textbooks (in library or elsewhere) which explain how to organise project activities and undertake effective technical writing. References must provide full bibliographic details and adopt a standard format. Further advice can be provided by the library staff if required.

NOTE

The end of the semester (both 1 and 2) in year 4 is a very busy time and it is crucial that students are planned and organised so that they can deal with what can be a demanding and stressful time. It is pretty much the innate nature of a degree programme and is part of the challenge of University and indeed professional life. However, there is a marked difference between the "natural" adrenalin-based pressure that we feel and actually need to motivate us through the challenge and deeper rooted stresses and well-being-impacting issues. Students are encouraged to talk at the earliest possible points with supervisors, PDA, year advisor or course director where issues around well-being etc are being felt to impact your studies. Talking and taking action at the earliest stage offers the most benefit in the long-run and can prevent or avoid escalation. At a practical level department staff can advise on processes and procedures as well as directing you to individual and appropriate support services offered by the University. It is never a good thing to leave things unaddressed or to leave until late in semester or after the examinations. Any discussions are confidential… and as they say in a very old TV advert .. "***It's good to talk***"…

PROJECT SCHEDULE



Associated Documents:

The following documents will be provided to students or staff either in paper or electronic form during the course of the project:

- Individual Project: Project Selection Form
- Individual Project: Statement of Intent
- Individual Project: Assessment Schedule
- Interim Report & Progress Feedback
- Individual Project: Submission Check List
- Individual Project: Poster Assessment Schedule
- Individual Project: Presentation Assessment Schedule
- Project Report Writing Guidelines (two versions)