ELEC6200 Group Design Project

As outlined in the syllabus for ELEC6200,

‘This module provides an introduction to intensive group project work in collaboration with an industrial or academic customer. Students work in groups of four or five on a challenging project which will be typically based on an idea from an industrial partner, or from a research project looking to transfer technology to industry or build a demonstrator/proof of concept.

The aim of the group design project is to encourage both innovation and engagement with the broader engineering context (financial, economic, social, environmental). The use of ‘real world’ engineering problems requires students to actively engage with their customers to determine the scope and requirements of their project, in order to provide a realistic simulation of the sort of challenges that they are likely to face as engineering graduates.’

This is a brief guidance document and should not be considered to contain every detail, but provides some of the organisational details not covered in the syllabus webpage.

The module (ELEC6200) consists of project work (assessed by a final report, self-reflection report and a poster presentation (similar to a professional meeting or conference), a presentation) as well as a further report on the general theme of ‘How technology makes profit’ which is informed by a series of lectures provided by industrialists. (Details of the second report are not described further here.) The students spending the second semester abroad are registered for a different module (ELEC6247), and only perform the project work and associated assessments (see syllabus for ELEC6247).

The student teams (4-5 students) are allocated projects according to their skills and preferences, declared in June. The projects are not confirmed to the students until they have registered for study with the University in September. The projects will be announced to registered students before the start of term and it is advised that the teams contact the allocated university supervisor prior to the start of term for a meeting in the first week at a time that fits into their combined timetables. If students are unhappy with the allocated project, a clear document explaining the reasons should be sent to the module leader. The project work starts at the beginning of the first semester (October), however there is an introductory lecture during ‘Freshers’ week’ for guidance and an opportunity for students to ask questions. Some of the university supervisors are present and this provides an opportunity to meet their student teams.

Before the project starts an agreement (this is a legal document between the project teams, the university and the external partner for intellectual property and non-disclosure agreement) will be signed by all members of the University team (the university supervisor, the 2nd examiner) and the industrial customers and possibly a further company (or independent contractor). A blank document is available on the module notes pages prior to the start of term, but in the first week the agreement must be signed where deemed necessary.

The project work lasts for the whole of the first semester, then the final report is submitted in the start of second semester. The students are expected to spend the equivalent of at least two full days per week on the project and students will manage other coursework (for other modules) and extramural activities so that they contribute regularly to the project. Following
submission, the reports are printed and assessed by the examiners, then there are final presentations at the end of the second term. Marks are not awarded until after the final presentation day and summative feedback is then provided to all students.

In the first week of term (start of October) the students are expected to arrange a meeting with their university supervisor (and where possible the industrial supervisor or equivalent (now defined as ‘the customer’) in person or by Skype or similar). Where it is not possible to meet up with the customer, the university supervisor will have been briefed by him/her. The students are expected to research the literature, patents, etc. appropriate to the project and to produce a project brief, a list of tasks (usually many of the ideas of how to achieve the tasks are put forward by the students) and a project plan (i.e. Gantt chart or similar appropriate to the project topic). This may include objectives and stretch objectives. The brief (including a list of tasks and a project plan) must be agreed with the ‘customer’ and the university supervisor. A draft project specification document can receive feedback with suggested changes before agreement by both parties and submission by the 2nd week of October. The anticipated size of the document is ~ 2 sides including schematics. This document will normally be appropriate for the whole project, however if the project objectives need revision the student team would normally produce a similar document with input from both the ‘customer’ and the university supervisor and this would be included in the appendix of the final report.

The students have previously taken taught modules in management, but this will possibly be the first time that they will apply some of the tools and methods taught. In the first week of term the student team must quickly decide upon a student project manager who should be responsible for management of all aspects of the project including regular meetings, project planning, liaising with the customer and the university supervisor. The project manager will also be responsible for logging all confidential documents provided by the company as well as a list of all literature and patents (of outside parties) identified by the student team. A log must be produced containing brief details of all key correspondence between the student team, university supervisor and the customer. Some confidential documents cannot be copied (it will state this on the document). All equipment provided by the customer, supervisor and from other locations within ECS or the university must be logged by the project manager in a proper record with location and stored in a safe place (for instance the lockers in the Project Laboratories). Any issues with equipment, software tools provided by others, etc. must be immediately logged and reported by the project manager to all members of the project team including the University supervisor and where appropriate the customer. A strategy to mitigate any risk of delays in meeting the project deadlines must be considered (usually in the weekly meeting).

The project budget is to be managed by the project manager. All requests for an extension of the budget should be discussed with the supervisor, prior to Dr Geoff Merrett. The project manager should be a key player in managing risks. (Note good organisation, i.e. orders should include VAT, delivery costs and lead times or stock at suppliers known before ordering (i.e. PCB boards).) The project manager will delegate most tasks.

The reality is that a very small fraction of research output is formally protected – it is just too expensive and there has to be real novelty. There is unlikely to be any formal searches done
by the ‘customer’ and the process of actually preparing and filing a patent is so prohibitively expensive that there has to be not only novelty, but also a clear (mainly financial) need for the IP. For the purpose of this project it is important that the data is properly recorded and documented. Most cohorts on the GDP will have used the laboratories on the third floor of Zepler and will have written all the preparation, design, build, test of practical electronics, electrical etc. in a laboratory book. All electrical/electronic and related work must be properly documented in a standard ECS laboratory book, signed and dated and key results scanned and included in the project appendix (this should also include any design, simulation and other computer based work ultimately leading to electronic/electrical or other technology.)

In the case of computer science projects SourceKettle (and for most projects Soton.git) should be used (being sure to maintain confidentiality of the project), it is important to have a record of all aspects of design, build and testing. All new code should be retained with the name of the person who wrote it and the date and a brief statement of software purpose, this should be collated for inclusion in the appendix also. All new information should be considered as confidential ‘know how’ for the purpose of this project.

The student team will meet ‘formally’ once a week and each team member would normally produce a brief progress report, where possible the university supervisor will be in attendance. The role of the university supervisor and customer will be usually consultative, but they may choose to provide advice regarding management/planning issues (if this arises). Contact with the customer will typically be less frequent than the university supervisor, but the customer (or a person delegated by them) is expected to be available by email and for meetings where necessary (by Skype is acceptable) to provide some updates of the project and discuss any challenges or issues where technical input would be valuable. It is advisable that the project manager produces minutes of all meetings as this provides a record of all agreed tasks, any revisions to the programme and any problems which may present a risk. This documentation may be necessary for evidence if problems arise, and if this occurs the module leader should be informed. If students are expected to visit a location outside of the university, dates and times will need to be arranged to fit in with the taught activities of the students in the team. It is valuable for students to visit the customer to obtain a full grasp of the requirements of the project and perhaps test systems, but such visits are not a regular occurrence.

The students will be required to provide two progress presentation seminars at the end of October and November. Slides are produced for a presentation of 15 mins and 5 mins of questions and the slides submitted by a deadline (given elsewhere) but the presentation should not contain content that cannot be viewed on university machines (no additional software can be installed and the whole presentation should run from a single .pdf or .ppt file). All students of the team must contribute to the presentation (verbally and slide creation), the project manager must be the only person to submit the file containing the slides to the hand in system. Students must attend the whole of their allocated session and are expected to offer questions to other groups presenting in the same session. All teams should seek guidance as to how to present without disclosure of IP, prior to submission. Usually the University supervisor will be in attendance and the customer should be advised (by the project manager) of the dates, times and location (lecture theatre) of the group presentation and is welcome to attend. Formative feedback will be given on the presentation as well as on the technical and the management aspects of the project by at least the university supervisor.
At the end of the project work and ideally before the final report submission, it is important that all 'borrowed' equipment or other items, are returned to the university supervisor or the ‘customer’. The project manager should have a log of all items, including details of any breakdowns. Each team may have a locker in the laboratories in building 16 and these should be cleared away.

The report (submitted at the start of the second semester) can be written by one or more of the students, but it is expected that all students check the report for consistency and content (the report format details are given elsewhere). An electronic appendix should also be produced including copies of meeting minutes, progress reports, pertinent correspondence, logs and copies of any pages of laboratory books which may be the seeds of new IP (and the log produced by the project manager), and code or anything else used in producing software, designs, CAD drawings, data from testing, simulations etc.. An excellent team will also include a manual for use of the 'product'. The appendix should not contain copies of confidential documents or data provided by the customer.

Soon after submission of the report (one version for the whole group), the presentation slides and poster should be submitted. These should be submitted by one member of the group only. Every member of the group should produce an individual reflection report for submission (guidance is given elsewhere). The summative assessment will be performed by the University supervisor (1st examiner) and an allocated 2nd examiner (and possibly a 3rd examiner will be called upon for moderation). The student team should consider obtaining a letter from their customer, providing feedback (to be included in the electronic report appendix file) and this may be used by the examiners for the assessment.

All submissions are final (no revisions to presentations are allowed at a later date. The reason for this is that all documents are being processed (incl. printing and then assessed by the 1st and 2nd Examiners. Where appropriate Agreements were signed at the start of the year so that the Group Reports can contain confidential information (Background and Foreground)

At the end of the 2nd term there will be a GDP presentation day to which the customers are invited. The student teams will present their project results in the form of slide presentations (20mins) and posters. These will form part of the summative assessment (similar to the project vivas), all students must attend unless they are registered to spend their second semester abroad. In that case, the absent students should produce a video recording for their part of the presentation and this should be ideally embedded into the presentation for one of the team members to use as part of the presentation.

Tracy Melvin, ECS, 2018.