E&CE | **Department of Electronic and Computer Engineering**

FINAL YEAR PROJECT GUIDELINES

Bachelor of Engineering in Electronic & Computer Engineering

Bachelor of Science in Cyber Security & IT Forensics

2021/2022

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FINAL YEAR DEGREE PROJECT

The final year project is undertaken throughout the two semesters of the final year and it is expected that preliminary work will commence during the preceding summer. The project is intended to give a student the chance to study a topic in depth and to apply his/her theoretical knowledge to a practical situation. The students learn to direct their own work, to be critical of their own methods, to conduct detailed experiments or analysis, and to report their results and reasoning. See Appendix 1 for more general advice.

SUPERVISION

The project supervisor is responsible for the providing satisfactory guidance for the project. A set of important milestones are given in Appendix 2. A student is expected to work on the project during the assigned project day and normally must be available for consultation with the supervisor throughout the project day assigned on your timetable. Students are expected to keep regular contact with their supervisor.

There is a nominal budget to support the project, and software and hardware supplies can be ordered subject to approval, see Appendix 3 for details.

A panel of assessors are assigned who help with the assessment of the project. Presentations are made to the panel which will include the project supervisor.

PROJECT MANAGEMENT

(a) **Autumn Semester**

During this semester the student should develop a clear understanding of the project objectives, become familiar with the theoretical aspects of the project, and study the background literature. This may take the form of text books, previous project reports or published research. Your Supervisor should be able to guide you on this. Towards the end of the semester the student should have produced some designs and a work plan for the remainder of the academic year. By the end of the semester the implementation aspects of the project will be well started

In October the student must submit a short project report and present the work to date. The outline content and format for this interim report is outlined in Appendix 4. The student should consult the supervisor to agree the exact requirements. The student's performance in the presentation, together with the interim report, will contribute to the overall assessment. The marks awarded by the panel will be recorded and be used in assigning final project grades. An M grade will appear on the student's transcript.

The Peer-Supported Learning Centre (C2-061) organises a short seminar on 'Presenting a Final Year Project' in weeks 5-6 of the Autumn Semester, to assist students in preparing and delivering their FYP presentations. All FYP students are required to attend.

Submitting the project deliverables

The interim report should be submitted no later than 16h00 on Friday of Teaching Week 7, (22nd October). No time extension will be allowed.

Submission requirements:

- Submit the electronic copy of the interim report in pdf format to your Sulis project module folder, e.g. BE E&CE FYP Module – EE4907, and BSc CS&IF FYP Module ET4907 and named as follows, where **xxxxxxxx** is your id number and **XY** are the initials of your supervisor e.g. CF for Colin Fitzpatrick;

    Surname_ FirstName_**xxxxxxxx_ XY**_Report.pdf

- Submit all auxiliary supporting material e.g. software, databases, data gathered etc. to Sulis, compressed in a **zip** file named as follows:

    Surname_FirstName_**xxxxxxxx_XY**_Aux.Zip

- You are also required to email all the above materials directly to your FYP supervisor

Teaching Week 8: Presentation to be given to your assigned Panel Wednesday 27th October. A 15 minute presentation will be given. Details of the precise times and locations for these will be posted to Sulis.

The presentation should cover the objectives of the project, detailed design decisions made (hardware, software or process related), and a plan of work with estimated completion dates for each task, against which the student's performance can be assessed. All major risks should be identified and assessed.

In the presentation, the student may use up to six slides and it should take no longer than 10 minutes to allow for questions. The quality of the presentation should be of a professional standard.

Before Christmas, some significant project progress is expected, based on feedback and direction received from the supervisor following the Teaching Week 8 presentation.

The project laboratory will be accessible to students during the break between the Autumn and Spring Semesters during normal office hours. The Department will try to make other special laboratory facilities available during the break between the Autumn and Spring Semesters. Students should consult their supervisors with requirements in a timely manner.

(b)   Spring Semester

In this semester the project will be completed. If a project requires any specialist items e.g. components, tools, software etc. it is the responsibility of the student to ensure that such components are ordered early in the year so as to ensure timely delivery of such items. Refer to Appendix 3 for ordering supplies.

The student must make every attempt to keep to the agreed project schedule. Any significant deviation from this schedule must be discussed with the supervisor. It is probable that some departures from the agreed project plan will occur. Such departures must be justified in the report as part of the discussions on specification, design and performance appraisal.

The final assessment of the project will be based largely on the final project report and a presentation/demonstration to a panel of assessors including your supervisor during teaching week 9 of semester 2. The outline structure of the report is summarised in Appendix 5. No grade will be awarded until any outstanding support material belonging to the University such as hardware components, software, books etc. are returned to the supervisor or to the relevant technician, library assistant etc.

Details of precise times for the presentations will be posted to Sulis. The location will be agreed in advance with the project supervisor. The exact nature of this presentation/demonstration will depend on the detailed specification of the project and this should be discussed with the project supervisor in advance of the presentation/demonstration. Where students have undertaken an industry based project the supervisor can request that a demonstration take place in the relevant company, if the nature of the project warrants this.

The final project report should be as per the guideline format outlined in Appendix 5, unless the project supervisor specifically defines an alternative format. The requirements for the final poster are given in Appendix 6. Details on how to correctly cite and reference the work of others are given in Appendix 7. It is really important that the references are presented professionally, and form an important part of the review and assessment process.

The Peer-Supported Learning Centre (Room C2-061) organises a short seminar on 'Technical Report Writing' in weeks 5-6 of the Spring Semester, to assist students in planning for and writing their FYP reports. All FYP students are required to attend this seminar.

Submitting the project deliverables

The final submission date for all the project deliverables is 16h00 on **Monday** of teaching **week 9** (21st March 2022) in the Spring Semester. This is a hard deadline.

Submission requirements:

- Submit the PDF format of your report to Sulis by 16h00 on **Monday 21st March 2022** of teaching **week 9**.
- Submit your poster in PDF format to Sulis printed to A1 paper size **Monday (14th March)** of teaching **week 8** (*see FYP Presentation Planner for further details on this process*)
- All posters will be published in a booklet form for presentation day
    - Submit the electronic copy of the final report and your poster, both in pdf format to your Sulis project module folder, e.g. BE E&CE FYP Module – EE4908, and BSc MC&S FYP Module ET4908 and named as follows, where **xxxxxxxx** is your id number and **XY** are the initials of your supervisor e.g. EL for Eled Lewis;
      ```
      Surname_ FirstName_xxxxxxxx_ XY_Report.pdf
      Surname_ FirstName_xxxxxxxx_ XY_Poster.pdf
      ```
- Submit all auxiliary supporting material e.g. software, databases, data gathered etc. to Sulis, compressed in a **zip** file named as follows:
    ```
    Surname_FirstName_xxxxxxxx_XY_Aux.Zip
    ```
    - You are also required to email all the above materials directly to your FYP supervisor
- Return any equipment used circuits etc. after the final presentation.

APPENDIX 1: General Comments

These comments are based on feedback from previous students.

The final year project is very important, not only because of the effects on your QCA, but also because External Examiners, and potential employers or postgraduate supervisors, will often focus in-depth on your project work. They will look at your performance closely, this is because the final year project is the one part of your course which requires you to work on your own and to use your own initiative and intellectual capacities to their full. It is very important therefore, that you work consistently and steadily through final year and liaise with your Supervisor regularly to ensure your performance is optimised.

Time management is critical. It is very tempting to relax after submitting reports and making presentations, thinking that little more is necessary for a few weeks and that you can catch up 'later'. You may be very short of time at the end or your project, which may impact on your grades in both your project modules and/or others.

For best results:

1. Work steadily and consistently;
2. Liaise with your Supervisor regularly (do not let problems linger longer than a week or so);
3. Identify special needs for equipment, facilities or components as early as possible (your Supervisor can help here again).

APPENDIX 2: Important Milestones

Milestone	Semester: Teaching Week	Description
1.	**Autumn: Week 1**	Contact should be made with supervisor and the project work started.
2.	**Autumn: Week 7 (Friday, 22.10.2021)**	Submit the PDF format of your report to Sulis by 16h00 on **Friday 22nd October** of teaching week 7
3.	**Autumn: Week 8 (Wednesday, 27.10.2021)**	Presentation to Panel, (Venue to be announced)
4.	**Autumn: Week 10**	Implementation work to be well underway.
5.	**Spring: Week 4**	The student should aim to have the bulk of the project work completed, allowing the remainder of the time for finishing, testing, analysis of results and report writing.
6.	**Spring: Week 8 (Monday, 14.03.2022)**	Create your poster and submit a PDF copy of the poster to SULIS (printed to A1 paper size (594 mm x 841 mm) along with your Abstract submission.
7.	**Spring: Week 9 (Monday, 21.03.2022)**	Submit the PDF format of your report to Sulis by 16h00 on **Monday 21st March** of teaching **week 9**.
8.	**Spring: Week 9 (Wednesday, 23.03.2022)**	Final Presentation/Demonstration, (Venue to be announced)

APPENDIX 3: FYP Budget and Ordering Supplies

There is final year project fund which supports buying components, kits or specialised software for your project, but only if necessary and with prior agreement.

FYP Component ordering Procedure

Final Year Project (FYP) components are normally ordered from Radionics (RS), or Farnell which are the **preferred supplier** Email the order to john.m.kelly@ul.ie and CC the project supervisor with the following information:

- Supplier name: https://ie.rs-online.com/ or https://ie.farnell.com/
- RS Stock Number / Farnell Stock Number
- Component description (e.g. resistor, transistor etc.)
- Quantity required
- Cost per component
- Total order cost

The FYP order will be added to the next outgoing order, usually the same day and normally arrives for collection in Stores (B2-011) within 2 to 3 working days of the order being placed but please note some items may be on back order and may take longer.

Any components or equipment purchased are owned by ECE and should be **returned to the project supervisor or Stores after FYP presentations.**

Ordering from Alternative Suppliers

If a student is ordering from other suppliers, *prior approval must be obtained from the supervisor and the chief technical officer (CTO) for reimbursement.* If the cost is within the allocated FYP budget ECE will reimburse the student through the CTO. Receipts will need to be presented for reimbursement. **Upon reimbursement, ECE becomes the owner of the component(s) and they are to be returned to the project supervisor or Stores after FYP presentations.**

APPENDIX 4: Format of Interim Report

The interim report should be, font size 12 Times New Roman, 1.5 line spacing. The report length is typically between 15 and 20 pages, but the supervisor can advise exact.

Sections of the Report:

1. **Introduction and project outline**

    Clearly documents the project aims and objectives.

2. **Literature survey**

    Review of the literature and the necessary background to the work.

3. **Theory**

    Present the analytical and technical theoretical aspects of the work.

4. **Outline designs**

    This should describe progress to date and typically include some detailed designs, describing hardware, software or process related topics, as appropriate for the project.

5. **Detailed action plan**

    This can be in the form of a Gantt chart for the project, in particular showing all the major tasks and their estimated start date, end date and duration in days.

6. **Requirements of facilities and materials**.

7. **References and sources of information**.

APPENDIX 5: Format of Final Project Report

The final report comprises of approximately 50 pages of main text. Only in exceptional cases can this limit be exceeded and requires supervisors authorisation. Exceeding the limit may adversely affect the project grade awarded. The report should state clearly what the student has achieved by unambiguously indicating the student's contribution and information gained from other sources, with references given. It must contain the following sections:

1. **Front title sheet containing following information:**

   Name, I.D. number, Supervisor's Name, Course Followed, Year, Department, Title of Project.

2. **An optional title page**

   Picture/Graphic representing project, Title of Project, Name, I.D. number, year.

3. **An abstract of not more than 200 words**

4. **The table of contents**

5. **Introduction**

   Clearly stating the objectives of the project and may include material from the report submitted in the Autumn semester

6. **A number of core chapters which might include:**

   Analytical Background,

   Specification and Design,

   Implementations,

   Results including measurements and facts about performance

7. **Discussion of results**

8. **Conclusion**

9. **References**

10. **Acknowledgements**

11. **Appendices**

    Normally only copies of data sheets of unusual devices should be included in the report. Discuss the inclusion of code listings etc. with your supervisor.

12. **Copy of poster**

General comments

Typing: The report should be Times New Roman, font size 12, 1.5 line spacing, with 2.5cm margins at top, bottom, left and right hand sides.

Style: The style of writing should be formal and impersonal, but attempting to interest a technically aware reader. Very detailed discussion of circuits, programs, software or intricate derivation of analytical results should be included in appendices.

References: References should acknowledge the contribution of others and indicate the level of awareness of students of work undertaken in his chosen field. More details are on the next page.

Acknowledgements: should thank contributors to the progress of the project: supervisors, technicians, typist and others.

APPENDIX 6: Format of Final Poster

A poster template will be available for creating your poster and guidelines given in the Spring semester, this can be seen in your SULIS site under "FYP_ECE_Poster_Template_A1",

The poster must normally be A1 sized (8 times the size of this A4 sheet!) and presented in portrait orientation. The objective is to present your project and results to a wider audience and to allow you a large degree of creativity on how you do that.

There will be an award for the best BE and BSc posters and a selection will be displayed in the department over the coming years.

Abstract submission: Students will be requested to upload their abstract from their original report into a single raw text file, via their Sulis site. The aim of such is for promotional use. All abstracts will be combined into one single document and created into booklet format. A booklet of the posters will be created and published on our web site.

APPENDIX 7: Citations and References

The *IEEE citation style* (see http://www.ieee.org/documents/ieeecitationref.pdf) for references should be used throughout the report. When referring to a reference within the text of the document, the reference number should be put in square brackets. For example:

> [1]
> [2], [3]
> [4]–[7]

For the references used, the *IEEE citation style* [1], [2] identifies the author(s), the source and the date of publication in a specific format according to the type of publication the reference appears in. The types of publication with their own referencing style are:

1. Books:
   a. Published books.
   b. Handbooks.
   c. Reports.

2. Conference technical articles:
   a. Basic format.
   b. For an electronic conference article when there are no page numbers.
   c. For an unpublished paper presented at a conference.

3. Online sources:
   a. Online source using a Digital Object Identifier (DOI).
   b. FTP.
   c. WWW.
   d. E-Mail.

4. Patents.

5. Standards.

6. Theses (M.S.) and Dissertations (Ph.D.)

7. Unpublished work.

8. Periodicals (journals).

UL recommends using the software package EndNote for handling references. EndNote is a bibliographic management software program which allows you to create your own reference database and then to use that database to generate a bibliography of your papers, books and theses. It is available in Desktop and Web versions and a copy for installation can be obtained from the library.

Examples from [1] are presented below and identify the citation style for the common types of reference. A more detailed description can be found in [1], [2].

(i)   **For Books**

Basic Format
[1] J. K. Author, "Title of chapter in the book," in *Title of His Published Book, x*th ed. City of Publisher, Country if not USA: Abbrev. of Publisher, year, ch. *x*, sec. *x*, pp. *xxx–xxx.*

Example
[1] B. Klaus and P. Horn, *Robot Vision.* Cambridge, MA: MIT Press, 1986.

(ii)   **For Conference Technical Articles**

Basic Format
J. K. Author, "Title of paper," in *Unabbreviated Name of Conf.*, City of Conf., Abbrev. State (if given), year, pp. *xxx-xxx.*

Example
A. Van den Bosch, M. Steyaert, and W. Sansen, "An accurate statistical yield model for CMOS current-steering D/A converters," in *Proc. IEEE ISCAS*, 2000, pp. 105–108.

(iii) **For Periodical (Journal) Articles**

Basic Format
J. K. Author, "Name of paper," *Abbrev. Title of Periodical*, vol. *x,* no. *x,* pp. *xxx-xxx,* Abbrev. Month, year.

Example
[1] R. E. Kalman, "New results in linear filtering and prediction theory," *J. Basic Eng.*, ser. D, vol. 83, pp. 95-108, Mar. 1961.

(iv)   **For WWW**

Basic Format:
[1] J. K. Author. (year, month day). *Title* (edition) [Type of medium]. Available: http://www.(URL)

Example:
[1] J. Jones. (1991, May 10). *Networks (2nd ed.)* [Online]. Available: http://www.atm.com

References

[1]   The Institute of Electrical and Electronics Engineers (IEEE). (2009, September). *IEEE Citation Reference* [Online].
        Available: http://www.ieee.org/documents/ieeecitationref.pdf

[2]   International Journal of Simulation Systems, Science & Technology, *IEEE Citation Style Guide* [Online].
        Available: http://www.ijssst.info/info/IEEE-Citation-StyleGuide.pdf