ECED 4900/ECED4901
Senior Year Project
Working Rules

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1. Senior Year Project Overview

The objective of the senior year project (SYP) course is to simulate a real-life situation of an engineer who needs to engage his/her analytical, design and solving skills in a project related to a practical problem. Whenever possible, industrial and/or private sector partners provide the projects for students to choose and work on.

This course is thus the ultimate challenge to the ingenuity and problem solving skills of the students. A practicing engineer from the sponsoring company guides the project in partnership with an internal faculty advisor.

This course spans over two academic Terms. Normally, the first term of the project is Term 7 (Winter) and the second term is Term 8 (Fall). During the summer work-term between terms 7 and 8 the students may continue to work on their respective projects.

For the fourth year students who will be switching terms and taking the academic term 8 before the academic term 7 it will be a two-term back-to-back senior year project where the first term will be Term 8 (Fall) and the second term will be Term 7 (Winter).

2. Outline of the Senior Year Project

2.1. SYP First Term Outline:

During the SYP first-term the students will be required to select a topic from the list provided by the ECED office or find a topic on their own and have it approved by the course coordinator. A suitable project will then be selected by the students in consultation with the department. The project will be under the supervision of a faculty member and an external industrial or other supervisor.

Meeting the supervisors is required in this term to review specifications and expectations, to define the project deliverables, work on a budget and develop a schedule to follow for the project. The students will be expected to submit a design requirement memo, deliver a short presentation and produce a progress report in this term.

A series of lectures will be offered throughout the term. The lectures will cover many of the concepts that will be useful in preparing to carry out the senior year project (project budgeting, intellectual property, time management, presentation skills, research and problem solving skills, etc). Each of these topics is intended to help the students carry out the project work effectively and successfully.

2.2. SYP Second Term Outline:

The students are expected to continue working on the project through its various design stages. These may include study, design and simulation, solving design problems, and laboratory or field experiments.

A presentation on the progress of the project will be delivered by the students during the weekly lecture time. A final exhaustive report, including the project background, all the steps of the design and the obtained results, is due before the final presentations. These final presentations will be held at the end of the term. The students will present and demonstrate all the work done during the senior year project and the obtained results.

3. Important Dates and Deadlines

The Dates and Deadlines presented below are **subject to modification**. The students will be informed if any changes are made such as change of dates, locations or cancellation of classes.

Week	Event	Deliverable
SYP First Term		
Week 1	Introduction	Project Proposal[1] deadline
Week 2-4	Invited Talk	Project Selection[2] deadline
Week 5	Invited Talk	Project Matching[3]
Week 6	Invited Talk	Meeting with Supervisors[4]
Week 7	Invited Talk[*]	
Week 8	Invited Talk	Design Requirement Memo deadline
Week 9-12	Proposal Presentation[5]	
Week 13	Proposal Presentation	Progress report[6] submission
SYP Second Term		
Week 1	Introduction	
Week 2-12	Seminar Presentation[7]	Meeting with Supervisors
Week 13	Seminar Presentation	Final Report[8] and Log Book[9] submissions
Week 16	Final Presentation Day[10]	

(*) if the SYP first term is the winter term, this invited talk will be cancelled because of the study break
(i) Refer to subsection (4.i) below for details.

4. Guidelines for the Senior Year Projects

4.1. Project Proposal Process

The ECE Department solicits project proposals from industry, government, faculty, the university and the research community. The proposing organization assigns a project supervisor who is to guide the students and monitor their progress. Either one or both the supervisor and/or faculty advisor must have a P.Eng designation. The ECE Senior Year Project Coordinator will assign a faculty member who ensures that the project meets departmental standards, and who will meet

with the students at least once every two weeks. This faculty member is a resource person for both the students and the project supervisor.

Once the proposals are received they are reviewed by the ECE Senior Year Project Coordinator to be approved. The Coordinator determines if the scope of the proposal is suitable based on the number of students and the time frame to be worked on. The ECE Department collects all proposals. The proposals are offered to the students registered in the Senior Year Project, for their selection.

If the students have contacts in industry or other external organizations, they can ask them to submit a proposal on the students' behalf. These must be submitted prior to the actual selection process in order to have final approval from the ECE Senior Year Project Coordinator. Proposal forms are available at: http://mems.ece.dal.ca/eced4900/ppform.doc.

Having a proposal submitted on students' behalf means those students do not have to take part in the projects selection process; they will be assigned to that project by default. Students are encouraged to seek such project proposals.

4.2. Student Project Selection Process

Once the proposals have been approved, there will be a list of project proposals sent out for the student groups* to make their top five (5) project selections. Please note that projects must have a minimum of two (2) to a maximum of four (4) students working together depending on the scope of the project and only if the scope of warrants it. The number of students required for each project will be noted on the project proposal.

*Project groups are to be made prior to the selection process. To make the process of making up groups as easy as possible, a list of students, including email addresses, who are registered in the first term Senior Year Projects will be forwarded with the list of project proposals.

4.3. Project Matching Process

Once the selections have been submitted on or after the project selection date, the project matching process occurs. Selections are determined on a first-come, first-serve basis. The sooner a group has made its selection and submitted it, the higher the probability will be of getting the first or the second selection. Once the process has been completed, the students will be informed which project each group has been assigned.

4.4. Coordinator and/or Internal Supervisor Time

The ECE Senior Year Project Coordinator will be available, by appointment, to students to discuss any general issues such as problems with getting parts, concerns about the viability of the project, possible partner or supervisor concerns. The Internal Supervisor should be available as well to answer any technical questions students may have.

Also, it is compulsory for students to meet with their Internal Supervisor bi-weekly throughout the entire duration of the SYP two terms. This time would be used for more technical aspects of the project, review and monitoring the progress and signing the log book.

4.5. Design Requirement Memo and Project Presentations in First Term

The design requirement memo should state what the problem is; list what will be done, and what the project needs, criteria, and deliverables are. Intellectual Property (IP) must be addressed if required by the sponsoring organization. The memo must be approved and signed by all 4 parties (team members, internal supervisor, client/external supervisor, and the senior year project coordinator).

The proposal presentation should explain the roadmap for the project. It should describe the project background and why it is important. It should include the work that has been done before, and clearly explain what the students are aiming to achieve and how they plan to go about it. Presentations will be 15 minutes in length. This allocated time is broken into a ten-minute presentation, in which the students groups will report on their project/progress/results, and a five-minute question and answer period. A power point presentation is required. The laptop and the projector can be booked through the ECE Office.

4.6. Progress Report in First Term

The progress report should include primarily the project background and objectives, detailed plan of work, project budget, milestones and timetable. A description of how the work will be distributed among the group members should be also included. The projects' challenges should be highlighted and explanations on how to approach the different tasks of the projects are also to be detailed. Preliminary results can be also included.

The general requirements for the progress report are as follows:

- Maximum length of 20 pages, not including title page, abstract, table of contents, references and appendices
- Inclusion of an abstract summarizing the project
- Appendices with extra information, if warranted
- Use a 12 pt font, 1.5 line spacing
- Submit to the internal and external supervisors for approval and signatures

Example of Progress Report outline:

1. Abstract
2. Objectives
3. Background and Significance
4. Proposed Approach
5. Project Budget
6. Work Plan and Milestones
7. Tasks Distribution
8. Preliminary Results
9. References
10. Appendices

4.7. Weekly Seminar Presentations

Attendance at the weekly student seminar presentations is compulsory. A sign-in sheet will be circulated during each seminar time. Allowances will be given for one un-excused absence. Students must discuss any extenuating circumstances that prevent them from attending all the presentations with the ECE Senior Year Projects Coordinator prior to, not after the fact. Ten percent (10%) of the final mark will be deducted from the student's total mark if he/she does not attend the required number of presentations.

In the second term, during the one hour lecture time slot on the timetable, one, two or three groups will present every week for the entire SYP second term. The seminar schedule will be determined at the beginning of the fall term. Presentations will be 15 minutes in length. As mentioned above, the presentation time includes a ten-minute presentation of student groups reporting on their project/progress/results, and a five-minute question and answer period. A power point presentation is required. Avoiding the presentation will result in deducting twenty (20) points from the total mark.

Ten (10) points will be deducted from the total mark if the weekly presentation is not prepared and delivered in a professional manner (power point, proper language, decent manners). For more information on oral presentation skills, review the assessment form for the Senior Year Project Presentations attached at the end of this document.

4.8. Final Project Report in Second Term

A final project report is required at the end of the SYP second term. The format of the reports should be discussed with the Industry (External) Supervisor(s) and Internal Supervisor. One copy of the report as a PDF document (one file) is to be submitted via email to Caroline (ecess@dal.ca) no later than 4:00 pm on Friday of Week 13. This becomes the property of the University. Reports received after the deadline will not be considered and hence will result in a failed grade for the course. Extensions on the time will not be granted. Reports are to be prepared in accordance with the guidelines noted below. Late submissions will receive a grade of zero.

Please discuss the format of submission with your Internal or External Supervisors as they may require their copy in an alternate format. It is the responsibility of the student group to arrange for delivery, typing or drafting assistance, if required.

Suggested Layout:

There are bound sets of previous projects in the ECE Office for reference that may be signed out for a 24-hour time period during each term.

1. All reports shall be typed as follows:

    a. Cover Page - course number, title, student names, supervisors, name of company, and date
    b. Letter of Transmittal
    c. Table of Contents
    d. Abstract

     e. Introduction

     f. Project Contents

     g. Conclusion

     h. References

2. Include specification sheets for special parts only. Do not include specification sheets if they are available in the Electronics Workshop.
3. Reports should be printed single-spaced on one side of the page.
4. Reports shall not exceed 30 pages in total – this does not include appendices.
5. Make reports brief but clear and professional.
6. Typed (typing and drafting assistance, if required, is the responsibility of the student).
7. Pages should be numbered.
8. Each project should be saved as one complete pdf file. This will be submitted to the ECE Support Secretary by email to ecess.dal.ca.

4.9. Guidelines for Log Book Requirements

Every student is required to keep an individual design notebook or log/lab book. The Internal Supervisor will be required to sign each log book once in two weeks. The log book should be hardcover (not wire wound) and signed with contact info. The Avery-Dennison Computation Notebook (Model 43-648) is preferable. Make the lab book easily identifiable (e.g. logo/stickers).

The log book should begin with a Table of Contents. Leave a few blank pages at the beginning. Fill in the table of contents as you use the book and number all the pages. Each new entry should be dated, and each new date should begin on a new page. The right side should be used for design work, the left side for rough calculations. Figures and graphs should be glued or stapled into the lab book. Emails are very convenient but also less concrete and less likely to be saved. Print out and glue important emails into the lab book, do not leave them loose. Whenever you do anything, it should be documented in the book. The lab book is a legal document; it is what proves that you did the work. The lab book is important since it will remain available long after you will have left, it should be the first place to look for research information. It is a good habit to get into; having all the information in one place is the key.

The lab book should be an accurate record of ALL the work. This must be shown to the Internal Supervisor, and his signature must be obtained at least twice monthly. Failure to comply with this requirement will result in loss of marks (as decided by the Coordinator).

4.10. Guidelines for Final Presentation

The projects' final presentations will be presented on one day. The presentations will take place on the week 16 of the SYP second term after all of the final exams have taken place in accordance with the schedule, which will be posted outside the ECE Office. Each student in the group is to present a portion of the oral presentation of the project work completed. A demonstration to prove the functionality of the design prototype is highly recommended and expected during or at the end of the presentation. The Internal and External Supervisors will attend the presentations and question the students on their work. Other interested persons are invited and encouraged to attend. The time allowed for each presentation will be 45 minutes.

Presentation of work   20 minutes

Questions   15 minutes
Set up and dismantling of equipment   10 minutes

If the External Supervisor is not available to attend the presentations, a set of questions will be provided to the Internal Supervisor to be asked during the presentation time.

Internal and External Supervisors evaluate the projects independently; the average of their respective assessments becomes the final mark. Refer to the assessment section for details.

All students must attend a minimum of four presentations in total, in addition to their own. They will be required to sign up for the four presentations prior to the sessions. Students who do not attend the required number of presentations will have ten (10) points deducted from their overall mark. A sign-up sheet will be maintained during the project presentations to ensure accuracy of attendance. Other students, faculty and friends are invited and encouraged to attend.

5. Provision of Resources for Senior Year Projects

5.1. Deposit on Parts for Project Required

The ECE Department pays for limited expenses incurred by each project. The External Supervisor is expected to contribute to the projects expenses as well.

A $50 deposit per student/per project is required. If no parts are required from the Electronics Workshop, no deposit is required. Please see the department chief technologist to determine if there is a need for a deposit upon initial request for parts. Some items are expendable and some are required to be returned. This will be predetermined by the department chief technologist upon signing out the parts and at the time of putting down the deposit. The deposit will be paid in cash to the ECE Office, Room C367 prior to the ordering of parts. The deposit will be returned once the project account with the Electronics Workshop has been settled by returning the required items.

NOTE: Please take into consideration delivery time when ordering parts; some companies are able to give next day delivery; some take weeks.

WARNING: If the account has not been settled as of the last day of the presentations, the responsible students will have a hold placed on their accounts until this has been achieved.

5.2. Lab Availability & Technician Time

Fixed times (see your 4th year timetable for times) will be scheduled during every week when the technicians and the laboratories, rooms C102 and C239, will be available for the students to prepare, test and work on projects. Students must be well prepared with proper documentations, i.e. drawings, questions, prior to meeting with the technicians.

This Lab time is not considered compulsory; it is there to give students space, time and technical assistance to complete projects; students are strongly encouraged to use it.

5.3. C102, Laboratory Access

There is a keypad installed. See Nicole or Caroline for more information. A code for each group will be given out at the beginning of the term.

5.4 General Office Facilities

Caroline (the Support Secretary), in the ECE Office, Room C367 will assist students with administrative services, such as use of the fax machine, use of the conference room, receiving couriered packages and the use of a phone for long distance calls. There will be several hours a week that the conference room C365 will be available for students wishing to make phone calls related to your project. Please look on the schedule outside the conference room for the available times and book it with the ECED Office.

5.5. Project Budget

Students should consider themselves engineering consultants, and view their supervisors as clients. The responsibilities for the project work involved should be accepted on this basis. If hardware components have to be purchased, the lead-time required on orders must be considered, and the resources for such purchases must be found. This should be covered by the external proposing supervisor. Prior approval from the External Supervisor is required on any items purchased over $50 - an email from the External Supervisor is sufficient for said authorization.

The ECE department has a very limited budget for the projects if necessary. Students must obtain prior approval from Mark LeBlanc for expenditures on items costing from $0 - $50. The Electronics Workshop personnel can advise students on what the ECE department can supply. Any discrepancies will be decided by the Senior Year Project Coordinator and the ECE Department Head.

6. Problems - Issues - Concerns

Although it rarely happens, proposed projects are not always found to be suitable. It is important that anybody having any difficulties or doubts about projects have them resolved as soon as possible.

It is the responsibility of the students to keep their supervisors informed (on a bi-weekly basis) about their work. Students must refer any difficulties, technical or logistical problems, to the ECE Senior Year Project Coordinator as soon as there is an indication that progress is becoming unsatisfactory or problems are occurring that appear to prevent the project's completion. The External or Internal faculty supervisor, the Senior Year Project Coordinator and the ECE Office will assist students in any way possible. The log book should also record such references or meetings.

Students should not leave their concerns to the end of the term; it is best to deal with them as they happen. For example, in the past, there have been conflicts and issues with partners not

pulling their weight, not being able to meet with the Internal or External Supervisor, parts ordered but not available or delivery time too long for the project's completion, etc.

7. Assessment

The senior year project assessment will be based on reports and presentations，and the quality of the demonstration shown during the final presentation day. The assessment criteria are as follows:

	Component	Deliverable	Due	Percentage of Total*
1	Design Requirement Memo	Written Memo	1st-term, week 8	20%
2	Proposal Presentation	Oral Presentation	1st-term, week 9-13	20%
3	Log Book	Notebook	1st-term, week 13	10%
4	Progress report	Report	1st-term, week 13	40%
5	Seminar Presentation	Presentation	2nd-term, week 2-13	20%
6	Final Report	Report	2nd-term, week 13	20%
7	Log Book	Notebook	2nd-term, week 13	10%
8	Final Presentation	Presentation/demo	2nd-term, week 16	40%

* Plus Seminar Attendance – 10% for each term.

The assessment of each component will be performed by the Internal and the External Supervisors or the course coordinator. The course final grade will be based on Dalhousie University's grading schemes. A failure to meet the expectation of the supervisors (e.g. active engagement in the project, meeting with supervisors) and/or to meet the derivable schedule may result in a failing grade.