

NANYANG TECHNOLOGICAL UNIVERSITY

School of Electrical & Electronic Engineering
Nanyang Avenue, Singapore 639798

Final Year Project

Full-Time Student Guidelines

September 2011

Compiled by

FINAL YEAR PROJECT COMMITTEE

Chairman :

Assoc Prof Lin Zhiping

Maintenance, overall coordination and special cases

Members :

- *Prof Wang Youyi* - Div of Power Engineering (EEE1)
Allocation of projects (Coordinate with CITS), and also coordination of non-graduating students from Wuhan University (WHU), China to do FYPs in EEE
 - *Dr Ong Keng Sian, Vincent* - Div of Circuits & Systems (EEE2)
SMP & RI project coordination (Coordinate with CITS, SMP personnel and RI coordinators)
 - *Assoc Prof Chau Lap Pui* - Div of Information Engineering (EEE3)
Appointment of examiners (Coordinate with CITS)
 - *Assoc Prof Huang Guangbin* – Div of Control & Instrumentation (EEE4)
Scheduling of oral presentation (rooms and time slots) (Coordinate with CITS)
 - *Assoc Prof Zhu Lei* – Div of Communication Engineering (EEE5)
Part-time FYP
 - *Prof Liu Ai Qun* – Div of Microelectronics (EEE6)
ISP project coordination (Coordinate with Madona/Ai Fang and Industrial sponsors)
 - *Ms Hau Wai Ping*
Webmaster, Admin & Technical Support
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1. INTRODUCTION

As part of NTU's curriculum, all final year students of the School of EEE are required to undertake a project, supervised by one or two faculty members. This project will involve an in-depth study, investigation, construction of hardware and/or development of software and testing in any of the areas of specialized courses offered in a final year option group, and spread over the whole academic year. Students are required to submit a formal report, carry out a project demonstration and also make an oral presentation on completion of the project.

The Final Year Project Committee of our School is entrusted with the task of overseeing the coordination of all the final year projects. The Committee has prepared this set of guidelines so that all students are aware of the various project requirements in terms of project schedule, project report and presentation.

1.1 Eligibility for FYP

The pre-requisites for EEE FYP can be found at www.ntu.edu.sg/eee/students/beng/full_time/courseinfo/fyp/. If you are an eligible candidature, an invitation email for project selection will be sent to you.

1.2 Project Duration

Students are allocated 9 hours per week for the project, spread over two semesters. In practice, the students spend more time than this, especially during the recess weeks and the vacation.

1.3 Project Proposals

Faculty members propose projects and act as supervisors. Every project proposed will contain details of various aspects of the project, including a 50-word summary of the scope, objectives etc. Projects proposed are in one of the following categories:

Type A: Internally generated project - Individual Faculty Projects

Type B : Externally generated Projects - Industry Sponsored Projects (ISP), Projects proposed for Special Manpower Program for IC Design (SMP), and Projects proposed by Research Institutes (RI)

The Final Year Project Committee will compile a final list of all projects, indicating the titles, name(s) of supervisor(s) and project summary, which will then be distributed to all students.

1.4 Project Selection and Allocation

Eligible candidates can select EEE FYP projects twice per academic year. For the main FYP batch (or Semester 1 batch), the selection is at the end of Semester 2 after the examination (usually the beginning of May). For the small FYP batch (or Semester 2 batch), the selection is at the end of Semester 1 after the examination is over (around the beginning of Dec).

Two methods are used for the FYP project allocation. The first method is defined as **Selection-by-supervisor** and the second method is **Allocation by Computer**.

1.4.1 Selection-by-supervisor

Students pick their preferred projects from the list of proposed projects in the FYP web and approach the respective project supervisors for discussion. During the project selection period, if the supervisor decides to offer a project to a particular student, the main supervisor will go through StaffLink and select the allocation option to pull the project for the student. Once this has been done, the student will be allocated to that particular project and the database will then be updated to keep the other students informed. The project will only be allocated after the supervisor has completed the selection-by-supervisor process. ***Students are advised to discuss with supervisors and select their projects carefully during this phase since allocated students are not allowed to drop out after this phase.***

1.4.2 Allocation by Computer

A student can select up to 10 projects. The program allocates projects based on the order of preference from students from their 1st to 10th preferences. If a project is chosen by only one student as the first preference, it will be assigned straight away to the respective student. If there is more than one student choosing a particular project as the first preference, the program will give preference to the student who put in more choices. If all the students put in 10 choices then a random number will be generated. This random number ranges from 1 to the total number of students choosing that project as the first choice. That particular project will be temporarily assigned to a particular student to the generated random number. After processing the first preferences of all the students, the same method is repeated for all the remaining unassigned students starting from their 2nd preference up to the 10th preference. At the end of this allocation cycle, the configuration of the project assignment and the number of the unassigned students are recorded.

A subsequent allocation cycle is repeated in exactly the same way as the previous cycle. A new project assignment together with the new number of the unassigned students are obtained and compared with the number of the unassigned students in the previous cycle. The program always keeps the configuration of project assignment that has a lower number of the unassigned students. Through processing of more than a thousand allocation cycles, the project assignment which has the minimum number of unassigned students is thus obtained. For the remaining unassigned students a second round list containing all the remaining projects is then listed on Web and the unassigned students will be invited to select another 10 choices. Allocation is again made on the basis of the preferences and the same allocation process is repeated. In the second round processing, all the students will be allocated a project of their choices.

1.5 Laboratory Allocation for Projects

Labs will be allocated to FYP students. Faculty members could indicate whether their project proposals have some special requests. The FYP Committee is working out a new scheme for lab allocation and will update the student guidelines when the scheme is finalized.

2. PROJECT ASSESSMENT

There are two components for the assessment of a project: 1) Interim Assessment and 2) Main Assessment. An interim assessment of the project is done at the end of the first semester of the project by the project supervisor(s), when the project is about half way through. The Main Assessment, which consists of Report, Demonstration, Oral Presentation and Final Assessment, is done at the end of the second semester of the project. To have an independent examination in the Main Assessment, the School will appoint an examiner for each project. Both the supervisor(s) and the examiner will perform an independent evaluation.

2.1 Interim Assessment

The interim assessment is done by the supervisor(s) only and is based on a Project Plan/Strategy, its implementation and an interim report about the project progress and results obtained. The supervisor will then grade the student to gauge his or her progress and performance at the end of the first semester of the project.

2.1.1 Project Plan/Strategy

During the course of the project, the students' progress will be closely monitored by the supervisor through meetings and/or progress reports. In the case of type B projects including ISP, SMP and RI-FYP, supervisor(s) may arrange for meetings with the students and the industry counterparts or RI co-supervisors. A short project plan/strategy report (2-3 pages) is required from the students about six weeks from the start of the project. This may be a summary describing the main objectives of the project, the student's proposed way of carrying out the project and a proposed weekly schedule in a chart form.

2.1.2 Interim Report

It is compulsory for each student to submit a short interim report at the end of the first semester. The interim report should highlight the progress made by the student towards meeting the objectives laid out in the project plan/strategy and it should normally contain 4-5 A4 pages.

2.2 Main Assessment

The Main Assessment is conducted at the end of the second semester of the FYP project. It has two components: (a) assessment of Final Report and Oral Presentation, which are assessed independently by both the supervisor(s) and the examiner, (b) assessment of Demonstration by the examiner only or Final Assessment by the supervisor(s) only.

2.2.1 Project Final Report

A formal, type-written final report in one-and-a-half spacing is required from each student. The main body of the report should normally contain 40 - 60 pages. If this guideline is not complied with, the student may be asked to resubmit the report.

A copy of the detailed guidelines on the format of the report and other requirements for the project is attached in Appendix A.

2.2.2 Project Demonstration

Immediately after submitting the final report, it is compulsory for the students to make arrangements for the examiners to view a demonstration of the projects. For those projects which are research oriented or exploratory in nature, for which project demonstration may not be possible, the examiners will interview the students to gauge how well they have understood their work.

2.2.3 Final Assessment

This assessment is done by the supervisor(s) only on the student's initiative, responsibility, ability and independence throughout the whole project duration as they are important ingredients contributing to the successful completion of the project.

2.2.4 Oral Presentation

An oral presentation by each student is compulsory. During the oral presentation each student will make a presentation. The supervisor(s) and the examiner will attend and assess the presentation. The time for an oral presentation will be 25 minutes for student, consisting of 15 minutes of presentation and 10 minutes for the question/answer session. Questions will be asked to assess the student's understanding and knowledge of the project.

Students who have valid reasons or official leave during the oral presentation period, must contact their supervisors and examiner well before the oral presentation.

2.3 Assessment Summary

A summary of the various assessments made by supervisor(s) and examiner is shown in the Table below.

Component	Assessor
1. Interim Assessment	Supervisor(s)
2. Report and Final Assessment	Supervisor(s)
3. Oral Presentation	Supervisor(s) & Examiner
4. Final Report & Demonstration	Examiner

The assessment criteria for the various assessments are given in Appendix B.

2.4 **FYP Schedule**

Please refer to the [FYP website](#) for the FYP schedule. Students should adhere to the given schedule.

3. **CHANGE OF PROJECT TITLE/SUMMARY/SUPERVISOR**

In some cases, it may be necessary to modify/change the project title/summary. The main supervisor can do so on-line at the Stafflink but changes cannot be made after the FYP committee has called for selection of projects for examination (around week 8 of the second semester of the FYP project). After the main supervisor has submitted the changes, the system will automatically send a notification email to the co-sup (if any) and the student of the affected project.

The FYP Committee does not encourage change of supervisor. For special case where the change of supervisor is necessary, the existing and new supervisors and the student must all agree with the change. In such a case, a request for change of supervisor must be submitted by the new supervisor by email only to Chairman of FYP Committee before the recess week of the first semester of the FYP project, copied to the existing supervisor, the existing and new co-supervisor(s), if any, and the student involved.

4. **FULL TEXT REPORT TO LIBRARY**

For instruction to submit Full Text Report (softcopy) to library through Digital Repository @ NTU, please go to the link <http://repository.ntu.edu.sg/drntu/procedure.htm>

5.. **FREQUENTLY ASKED QUESTIONS (FAQs)**

Some commonly asked questions and answers can be found at http://www3.ntu.edu.sg/eee/fyp/ft/faq_ft.asp.

APPENDIX A - GUIDELINES ON THE FORMAT OF THE REPORT AND OTHER REQUIREMENTS

1. The main body of the report (excluding charts, diagrams, appendices, tables, references, etc.) should normally contain 40 - 60 pages. You may have to resubmit a condensed version of your report if you exceed this limit.
2. Your report should meet these typing and layout requirements:

Component	Assessor
Page	White A4 size bond paper of at least 80g /m2.
Text	Times New Roman, font size 12
Margins	35mm margin on the left hand side and 30mm on the top, bottom and right hand sides of each page.
Typing	The same font and pitch for the whole report except when highlighting important matters.
Spacing	One-and-a-half spacing.

3. To maintain consistency, all students are required to follow the same format for preparing final reports, The contents of the report should be in this order:

- (a) Cover Page
- (b) Table of Contents
- (c) Abstract (*not more than one page*)
- (d) Acknowledgements to give recognition of any advisory or financial assistance received in the course of the work on which the report is based (*optional*)
- (e) Acronyms (*optional*)
- (f) Symbols (*optional*)
- (g) List of Figures
- (h) List of Tables
- (i) Main chapters (Chapter 1, Chapter 2.....)
- (j) ** Discussion/Conclusion
- (k) References
- (l) Appendix (*optional*)

** Include, as many as it is possible, the following topics (outcomes), how you

- Use the techniques, skills, and modern engineering tools necessary for engineering practice with appropriate considerations for public health and safety, cultural, societal, and environmental constraints;
- Understand the impact of engineering solutions in a societal context and to be able to respond effectively to the needs for sustainable development;
- Function effectively within multi-disciplinary teams and understand the fundamental precepts of effective project management.

[Click here](#) for the report template file.

4. The Standard International System of Units (SI) should be used
5. Each reference, be it from a journal, text book or conference proceedings, should be listed consistently, as in the example below.
 - (a) Breuer, M A, and Friedman, A, Diagnosis and Reliable Design of Digital Systems, Computer Science Press, Potomac Md, 1976.
 - (b) Wakerly, J F, 'Microcomputer reliability improvement using triple-modular redundancy', Proceedings of the Institute of Electrical and Electronic Engineers, Vol. 64, No 3, March, pp 889-895, 1976.
 - (c) Hata, M Kinoshita, K, and Hirade, K, 'Evaluation of diversity effects on mobile radio system design', The Transactions of IECE of Japan, Vol. 64, No 5, May, pp 31-33, 1981.
 - (d) Comer, D J, Digital Logic and State Machine Design, 2nd ed. San Francisco, Saunders (HRW), section 7.1B, 1990.
 - (e) Mano, M M, Computer Engineering Hardware Design. New York: Prentice-Hall, sections 5.2 and 5.3, ch. 7, 1988.

- (f) Tanenbaum, A S, Structured Computer Organization, 3rd ed. Englewood Cliffs, NJ: Prentice-Hall, section 4.2.1, 1990.
- (g) PAL Device Data Book, Advanced Micro Devices, 1990.

6. The Final Year Project Report is an important component in the assessment of the final year project. It is written for these main readers: the supervisor(s) and the examiner for the project. The examiner is an independent party appointed by the School to assess the project. Very often the project report is the main instrument the examiner uses to judge the project. He/she may not be aware of the many hours the students may have spent on the project. The credit given to the students will be based mainly on their understanding of concepts and knowledge shown in each report. So a poorly or carelessly written report, presented after months of hard work by each student, may not be received well by an examiner.

In a project report, one generally looks for the following:

- (a) a clear idea of the scope, objectives and background of the project.
- (b) analysis of all factors in the project, noting dependency of constraints. A clear and concise presentation of any theory required must be made.
- (c) use of references which gives evidence of the students having read about the related subject. A list of references alone is insufficient. Any work, not done by the students, but included in the report, must be duly referenced. It is to be noted that plagiarism is a serious violation.
- (d) results, discussions and suggestions for further work to assess the understanding of technical concepts and the perception of the value of the work done. Results must be appropriately presented with tables, graphs, charts, etc., wherever possible and must be linked to the objectives of the project. Interpretation and discussion of results must be put into the context of the work.
- (e) a logical organization of the report to allow readers to grasp the contents readily. It is not always necessary that the information be organized chronologically. The students should put effort into thinking of the best way to present the information for the convenience of their readers. There must be a logical sequence of chapters, links between chapters, and sequence and links within chapters.
- (f) a good standard of written English, proper format and layout of the report.

7. For more information on project report writing, it is suggested that the students refer to the following:

Dorothy Cheung, Lai Phooi Ching, John S T Cheung, "What Every Engineering Student Should Know About Project Report Writing," 2nd Edition, Longman Singapore, 1992

- 8. You need to submit a softcopy (a pdf file) of the final report to the supervisor(s) and examiner unless the supervisor(s) or the examiner requests the student to submit the final report in hardcopy (double sided, ring bound) at least 3 days in advance
- 9. After your oral presentation, if the main supervisor requests, the student needs to submit a softcopy (a pdf file) or hardcopy (double sided, ring bound or hard-cover bound) of the final report or the revised final report to the main supervisor, depending on his/her request if the main supervisor requests, the student needs to submit a softcopy (a pdf file) or hardcopy (double sided, ring bound or hard-cover bound) of the final report (if no revision is required) or the revised final report to the main supervisor, depending on his/her request.
- 10. For hard-cover bound, the binding should be in dark blue with gold lettering. The use of NTU logo is recommended. [Click here for the SAMPLE COVER PAGE](#),

APPENDIX B - ASSESSMENT CRITERIA

1. Interim Assessment (by supervisor (s) only)

- 1.1 Planning and Strategy
- 1.2 Interim Report and Results

2. Main Assessment

2.1 Project Final Report (by supervisor (s) and examiner)

- 2.1.1 presentation of the report
- 2.1.2 theory, design and implementation
- 2.1.3 Introduction, Indication of research through relevant literature review, Comparison with relevant work, Detailed discussion and substantiated conclusions
- 2.1.4 results, quality of work and level of complexity

2.2 Project Demonstration/ Interview (by examiner only)

2.3 Final Assessment (by supervisor (s) only)

- 2.3.1 Initiative and Responsibility
- 2.3.2 Ability and Independence

2.4 Oral Presentation (by supervisor (s) and examiner)

- 2.4.1 Contents and Organisation
- 2.4.2 Effective Presentation
- 2.4.3 Accurate rebuttals to questions

APPENDIX C – FYP SCHEDULE (click [here](#) for actual schedule)

Scheduled Task	* Tentative Schedule
During the 1 st semester of the project	
Project plan/strategy	Week 6
# Interim report	# Week 13
During the 2 nd semester of the project	
Change of project title/summary	Until week 8
Appointment of examiners/Call for selection of examiners	Week 8 - 10
Draft final report	End of week 10
† Final report to supervisor(s) and examiner	End of week 12
Project Demo	Week 13
Announcement of oral presentation schedule	Week 13
Oral presentation	The week after exam
Full-Text report of your project (soft copy) to the library through Digital Repository @ NTU.	Within 1 month after the oral presentation
†† Final report if requested by main supervisor	1 week after oral presentation

For ABP students doing IA during the 1st semester of the project, the submission schedule for interim report is week 2 of the 2nd semester of the project.

† Final report should be in softcopy (a pdf file) unless the supervisor(s) or examiner requests the student to submit the final report in hardcopy (double sided, ring bound) at least 3 days in advance.

†† If the main supervisor requests, the student needs to submit a softcopy (a pdf file) or hardcopy (double sided, ring bound or hard-cover bound) of the final report (if no revision is required) or the revised final report to the main supervisor, depending on his/her request.

*** The exact schedule will be given by email and in the FYP website in due course.**