



Final Year Project Guidelines

Department of Civil & Environmental Engineering



Revision History: October 2004
 October 2005
 October 2006
 October 2007

Table of Contents

Table of Contents	iii
Introduction	1
Project Selection.....	1
Deliverables.....	5
Timelines	5
Deadlines at a Glance	6
Project Report Guidelines	6
Inception Report.....	7
Interim & Final Report.....	8
Grading.....	9
Written Reports	9
Oral Presentation	9
FYP Course Grade	10

Introduction

The Final Year Project (FYP) course (CIVE 501-502) was recently introduced in the Civil Engineering curriculum to prepare students for engineering practice. It is an important piece of work that requires the synthesis of the knowledge and skills acquired in earlier course work, some creativity, and original thinking. It is considered as the capstone of your undergraduate studies.

The final year project allows students to specialize in a topic that they enjoy and in which they can prove themselves. The FYP experience entails long hours of work and constant diligence. It is an opportunity for developing analytical and problem solving skills in addition to other skills that cannot be taught in classrooms.

The FYP course was designed to satisfy the program outcomes of the Civil Engineering curriculum in line with the Accreditation Board for Engineering and Technology (ABET) recommendations. These program outcomes are:

- An ability to apply knowledge of mathematics, science, and engineering.
- An ability to identify, formulate, and solve engineering problems.
- An ability to conduct experiments, as well as to analyze and interpret data.
- An ability to design a system, component, or process to meet desired needs.
- An ability to use the techniques, skills, and modern tools necessary for engineering practice.
- An ability to appreciate the impact of engineering solutions in a local and global context.
- An ability to function in a team environment.
- An ability to communicate effectively.
- An understanding of professional and ethical responsibility.

The final year project will instill in students the importance of teamwork, expose them to multi-disciplinary considerations (e.g. economic, social, political, safety) and improve their communication skills (written and oral). The final year project is the largest single piece of work that prospective employers will most likely be interested in during a job interview.

Project Selection

The final year project is selected from a list of FYP topics prepared by the department. The topics for the academic year 2007-2008 were finalized after a process of discussion and solicitation of ideas from faculty members and students. The projects were organized by themes revolving around community development and infrastructure assessment and sustainability. Project topics typically involve at least two disciplines of Civil Engineering or of a related field, e.g. Geotechnical and Environmental, Structural and Mechanical. Projects are of a practical nature and involve an engineering design

Final Year Project

component and require a problem formulation, analysis, and critical evaluation. All projects/proposals should have a clear objective and a range of feasible solutions.

Project Topics and Selection Procedure

Five project themes/topics were selected by the CEE Department. Student groups of four should rank the five themes/topics in order of preference, and “bid” for the first two selected. Groups should submit a bidding proposal of three pages, as follows:

Page-1: Letter of Intent, addressed to the Department of Civil and Environmental Engineering (your client), which consists of a cover letter to include:

- Group names and affiliation
- Date of submittal
- Short paragraph of interest in bidding for the proposed projects
- Ranking of themes/topics from 1 to 5 [use reference names]
- The two themes/topics (ranked 1st and 2nd) to be selected for bidding (include theme title and specific project title)

Pages 2 and 3: Bidding Proposal for the two projects selected, each on one single-spaced page, to include:

- Group names
- Theme/Topic title
- Specific project title proposed within the theme selected
- Proposed region/village/community in which the project is intended to be studied and implemented
- Rationale for the project selection including needs, relevance/importance, and benefit to the selected locale
- Scope of Work: What you intend to do and how far you intend to take the topic, based on the themes/topics briefs.
- A brief note on feasibility and applicability

Final selection and project assignment will be by competition amongst groups based on the bids presented.

Project Titles/Themes - FYP 2007-08

1. Water Resources Planning and Management [Ref: 1-Water]- The issue of water supply for domestic, agricultural and industrial purposes is critical in many if not all regions in Lebanon. The project includes for the locale of your choice:
 - a. Estimation of current and future water demands.

- b. Identification of alternative and complementary water resources management options. These could include "structural" measures such as: dams/reservoirs/ponds, rainwater harvesting, groundwater mining, desalination, etc.; and/or "non-structural" measures such as: water demand management, water pricing, groundwater depletion management, etc.
 - c. Design of solutions for management, treatment and delivery of water to the community, as needed.
2. Public Youth Sport/Educational Facility [Ref: 2-Facility] Most regions of Lebanon suffer from the lack of dedicated and well designed public facilities for activities directed at the youth. The project includes for the locale of your choice:
 - a. Identification of needs (current and projected): Numbers of potential users and what types of integrated activities (sports, recreational, educational-library/theatre, ...).
 - b. Selection of physical location in the target area and master plan for the proposed facility (may require input from architect/planner).
 - c. Design of all/select components of the facility including structural /geotechnical design of buildings/theatres/arenas, transportation/traffic/access, water/wastewater needs, ...).
3. Existing Infrastructure Assessment and Solutions for Improvement [Ref: 3-Infrastructure] The age of the basic infrastructure/public facilities in Lebanon is reaching the point at which they have become a major concern (roads, bridges, power plants, public buildings-schools/hospitals/fire stations/etc.). As such these facilities are vulnerable to a number of risk factors including earthquakes (shaking, liquefaction, tsunamis,...), accidents, blasts (e.g. war related):
 - a. Select one facility and/or type of infrastructure: Type, location, ...
 - b. Identify risks associated with the selected facility and scale of negative impact on neighbouring communities and/or users.
 - c. Assess the current state of the facility(ies) selected (e.g. road conditions, bridge deterioration, building status,...) and analyse the vulnerability of the facility, in light of the identified risks.
 - d. Propose and design mitigation measures/solutions.

4. Dedicated Truck Highway/Tunnels [Ref: 4-HighwayTunnel] The geographic location of Lebanon allows it to play a major role in goods transit from western producing countries. Trucking has traditionally presented the most economical and effective transport solution. However, the status of the countries' roads and highways has suffered significantly as a result. The proposed "Arab Highway" included an alternative for a dedicated truck highway linking Beirut to the Eastern border crossing at Masna'. Such an alternative would include a tunnel through the mountain range.
 - a. Identify the current and projected truck traffic which would be served by the dedicated highway.
 - b. Identify the section of the highway which you will be concentrating your work on. This section should include a portion through the mountains (tunnels, ...).
 - c. Design alignments, tunneling methods and support, pavement sections, etc.
 - d. Economy/Aesthetics/Environment.
 - e. Management and maintenance of the highway (toll, etc.)

5. Sustainable Civil Systems (Building/Materials, Infrastructure) [Ref: 5-SustainableSystems] Sustainable civil systems are the way of the future. Properly conceived and designed Civil Engineering Systems can have a direct positive impact on the living conditions of communities both urban and rural. The sustainability of a civil system is function of appropriate design decisions/choices, materials, construction techniques/practices, and operation and maintenance. The issues of concern here relate to traditional vs. modern/imported materials, methodologies, design philosophies, etc. The objective of this project is to improve performance of new and/or existing systems. The system to be designed or improved could be a house/building or a civil infrastructure element (road/pavement, bridge, ...), or elements/components that constitute the system. The project includes for the locale of your choice, as relevant:
 - a. Data collection of site conditions in village/area selected and study of market for variety, availability, and cost of appropriate construction materials/elements, processes, and equipment.
 - b. Evaluation of building/infrastructure materials/elements performance in relation to structural integrity, durability, and energy efficiency.
 - c. Feasibility and cost effectiveness study of alternative systems proposed with different construction materials/elements and selection of appropriate system(s).

- d. Design and construction of prototype of selected system or components to demonstrate validity. A brief outline of 3 preliminary proposals is to be submitted by each student group. Members of the Faculty will select the one that satisfies best the FYP criteria as stated in the introductory paragraph, and subject to the availability of the faculty members concerned. Each student group is normally made up of a maximum of 4 students, and each group must have a supervisor and a co-supervisor, one from each discipline. The students must register in the courses offered by their supervisor and co-supervisor that are relevant to their project work, and can therefore substitute the course project requirements, whenever applicable, with the relevant part of their final year project.

Deliverables

Fall semester

- Inception Report

Spring semester

- Interim report
- Final report
- Oral presentation
- Poster presentation

Timelines

Fall semester

Submittal of a brief outline of 3 preliminary proposals	October 18, 2006
Final proposal based on the FYP criteria	November 15, 2006
Inception report	January 17, 2007

Spring semester

Interim Report	March 21, 2007
Final Report	May 02, 2007
Poster Presentation	May 15, 2007
Oral Presentation	TBA

Deadlines at a Glance

Inception Report	January 17, 2007
Interim Report	March 21, 2007
Final Report	May 02, 2007

Project Report Guidelines

The project report should be of a professional quality. Students are expected to present their FYP reports in a manner as would be required in the profession with correct spelling, grammar, and syntax.

The report should be typed using a word processor and printed on A4 paper with a 3 cm margin at the left hand side and 2.5 cm margin at the top, bottom and the right hand side. The text must be in 11 or 12-point type and the headings in 14-point type with 1.5 line spacing. The headings are numbered according to the decimal system. Each main heading is a whole number and the sub-heading is numbered as a decimal of that. The font should be Times New Roman, Arial or similar. Each page of the report should be numbered in the top or bottom right-hand corner. The title page must include the title of the project, the authors' name, date and place.

All graphs should be produced using graphics software. The figures must at least be of the size of half a page and must have a caption and labels. Each table must have a title, and all columns and rows should have appropriate headings. All figures and tables must be cited in the text.

The computations or solution procedures should be done or outlined in orderly steps with all assumptions clearly stated and their source given. All calculations should be reproducible. All units should be clearly indicated. Use of computer programs such as EXCEL or MATLAB is encouraged.

The reference list should be explicit with the author's name, title, publisher and date. References should be correctly cited in the text by giving the authors' name and date of publication [e.g. *Roberson & Crowe*, 1995]. Acknowledgments should be duly conferred and copied material should be duly credited.

The structure and the content of the inception, interim and final reports are outlined below.

Inception Report

The Inception Report should include

- Description of the problem
- Literature review
- Proposed methodology
- Work plan

The Structure of the inception report should be as follows:

- Title page
- Table of Contents
- List of Figures
- List of Tables
- Summary
- Introduction & background material
- Literature survey
- Methodology
- Implementation plan
- Conclusion
- Acknowledgments.
- References: Books, papers, lecture notes, ... etc
- Appendices: Relevant information

Interim & Final Report

The interim report is a miniature version of the final report. The final report should include:

- Cover & Title Page
- Table of Contents
- List of Figures
- List of Tables
- Executive Summary
- Introduction
- Literature survey
- Underlying engineering principles
- Solution methodology
- Data collection
- Implementation and evaluation
- Discussion and analysis
- Concluding remarks: A critical appraisal of the project
- Acknowledgments
- References: Books, papers, lecture notes, ... etc
- Appendices: Relevant information listing all support material

The length of the final report should not exceed 20 pages excluding the appendices. A soft copy of the final report should be attached to the hard copy version.

Grading

Written Reports

The grading of the reports is based on the format, the content, the originality, and the professional appearance. The distribution of the grade is as follows:

- | | |
|--|-----|
| ▪ Structure & Format: Cover Page, Figure Captions, Table Titles and References | 20% |
| ▪ Background Material: Introduction and Literature Survey | 20% |
| ▪ Methodology: Accuracy and Completeness | 20% |
| ▪ Analysis & Discussion including Conclusion | 20% |
| ▪ Presentation & Aesthetic: Figures, Tables and Overall Appearance | 20% |

Late submissions are penalized at 5% per weekday.

Oral Presentation

The oral presentation should be conducted using multimedia tools (e.g. Powerpoint). Fifteen minutes are allocated for each oral presentation followed by up to five minutes of questions & answers. All participants of the project must take part in the oral presentation. The oral presentation session will be open to the public.

The oral presentation is graded as follows:

- | | |
|---------------------------------|-----|
| ▪ Structure | 20% |
| ▪ Background Material | 20% |
| ▪ Technical Content | 20% |
| ▪ Professional & Aesthetic look | 20% |
| ▪ Elocution | 20% |

Final Year Project

FYP Course Grade

The distribution of the FYP course grade is as follows:

Fall semester

- Inception report 70%
- Student performance 30%

Spring semester

- Interim report 20%
- Final report 30%
- Oral presentation 30%
- Poster presentation 10%
- Student performance 10%

The grade of the written reports is the same per group. However, the grade of the student performance is done on an individual basis.