



Yarmouk University
Hijjawi Faculty for Engineering Technology

Graduation Project Handbook

2018

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1. Introduction

The Graduation Project (GP) is divided into two courses which are Primary Project (1 credit hour) and Secondary Project (3 credit hour) where students register for the GP courses in two consecutive semesters. The students are required to complete the Primary Project which consists of GP proposal by the end of the first semester. The Primary Project is considered as a preparation phase for the GP where students prepare a proposal for the project idea and conduct preliminary study on the feasibility of the idea and all related work. In the Secondary Project, students are required to fully complete their GP's according to the proposal delivered in the Primary Project. The Secondary project is assumed to be a continuation to the Primary Project. In the case of a student is unable to do his Secondary Project based on Primary Project, special arrangements are made to place the student with a new project idea and new supervisor.

2. Objectives

The objective of the GP is to provide students with the knowledge and skills required for solving industry-related design problems and real life open-ended problems. Therefore, students are expected to use the knowledge and skills they gained during their study in developing engineering designs in the form of systems, processes or software. Further emphasis is also placed on improving their soft skills such as technical writing and oral communication.

3. Intended Learning Outcomes

In general, upon completion of the GP, students are expected to:

1. Ability to collect and analyze data, and finally draw conclusions through experimentation and simulation.
2. Ability to identify, formulate and solve engineering problems
3. Ability to design a system, component or process with defined constraints.
4. Ability to implement designed solutions
5. Ability to conduct literature review in the project domain.
6. Ability to communicate effectively through written reports and oral presentations
7. Ability to function in multidisciplinary teams

4. Overview of Graduation Project Process

GP's are planned to be an intensive and active learning process. This process requires a measurable effort to plan, implement, present as well as document the project. The following subsections provide the main processes of the GP.

A. Selection Process

Potential supervisors suggest graduation projects ideas in the form of a short summary that includes:

- Title of the project.
- Required students skills (if special knowledge is needed).
- Nature of the final deliverable (Software, Hardware, etc.)

Department chair posts project ideas one week before the beginning of the semester. Students team in up to three students teams and submit applications with three choices from the posted projects. Projects are assigned to students within the first week of the semester according to the average GPA of the group and the group choice from the announced project titles.

B. Duties

After placement of students with their supervisors, students are required to work on their GP continuously under the supervision of the supervisor. In general, the duties of each party are as follows:

- *Advisors should:* 1) Supervise students, 2) Prepare the schedule of the different tasks, 3) Control and monitor the progress of the project, 4) Assess students individually, 5) Review the final reports.
- *Students should:* 1) Attend meetings, 2) Complete the assigned tasks on time, 3) Write the report and prepare presentations.

C. Project Examination Committee (PEC)

A Project Examination Committee (PEC) is formed of at least three faculty members by the department chair of each department two weeks before the final defense of the secondary project.

D. Project Assessment

The graduation projects is evaluated at the end of each semester by the supervisor and PECs based on the project deliverables. In the Primary Project, students are only assessed by the supervisor based on the project proposal report and a final oral discussion. For the secondary project, students are assessed by both the supervisor and the PEC with equal share in the final mark. In general, the supervisor assesses the project progress, timely execution of the deliverables, and students overall understanding and efforts while the PEC assesses the final outcome of the project through oral discussion and through examining the final project report.

E. Project Deliverables

The deliverables of the GP for the primary and secondary phases are illustrated in Table 1 and Table 2 respectively where a description of each deliverables and due date are shown. The deliverables are mandatory and **must** be submitted to the supervisor on the due date. The supervisor has the right to reject or accept the late submission or apply a **penalty** to any late submission of deliverables.

Table 1: Deliverables of the Primary Project.

Deliverable	Descriptions	Due Date	Submitted to
1. Project Proposal Summary	A two-page proposal summary which includes problem statement, project goals and objectives, timetable and workplan.	4 th week	Supervisor
2. Intermediate Report	Overview of related research work (literature survey), market research, problem formulation and the proposed solution.	10 th week	Supervisor
3. Final Report	- A complete report that contains all material from the Intermediate Report in addition to methodology, design issues, constraints, assumptions, environmental implications and risk assessment. The final report must adhere to the final report template of the Secondary Project.	14 th week	Department
4. Oral Presentation	Oral presentation of the final report with illustrative material, using PPT slides before the supervisor.	15 th week	Supervisor

Table 2: Deliverables of the Secondary Project.

Deliverable	Descriptions	Due	Submitted to
1. Progress Report	Students should submit a 6-page progress report on the details of the state of the implementation of the project to the supervisor.	6 th week	Supervisor
2. Final Project Report	The final report is a comprehensive report which contains material from the Primary Project final report in addition to description of the following: 1. Implementation and testing 2. Evaluation of the project results 3. Conclusions and recommendation for future work. The final report must adhere to the final report template of the Secondary Project.	13 th week	PEC
3. Final Oral Presentation	Oral presentation of the results/prototype and completeness through demonstration and presentation (PPT slides).	15 th week	PEC

5. Assessment

The percentage distribution of project assessment criteria is illustrated in Tables 3 and 4. The assessment of GP is guided by assessment rubrics in Tables 5,6, and 7 for Primary and Secondary Projects respectively. The supervisor submits an assessment report for each student showing his achievement in all categories of the assessment rubrics. The PEC also submits an assessment report for a each student showing his/her achievement according to the rubrics.

Table 3: Percentage Distribution of Primary Project assessment criteria.

Criteria	Supervisor Score
Proposal Summary	15%
Intermediate Report	15%
Final Report	30%
Oral Presentation	40%
Total	100%

Table 4: Percentage Distribution of Secondary Project assessment criteria.

Criteria	Supervisor	Examiner (s)
Progress Report	20%	-
Final Assessment	30%	-
Final Report	-	20%
Final Presentation	-	30%
Total	50%	50%

Table 5: Assessment rubrics for Primary Project.

Category	Professional Quality ">=90"	Expected "80-89"	Acceptable "60-79"	Below Expectation "<60"	Score	
Project Proposal Summary (15%)	1. Problem Statement	<ul style="list-style-type: none"> • Proposal Summary illustrates clear understanding of problem • outstanding consideration for need and potential user adaption 	<ul style="list-style-type: none"> • illustrates good understanding of problem • good consideration for need and potential user adaption. 	<ul style="list-style-type: none"> • illustrates little understanding of problem. • It shows little consideration for need and potential user adaption. 	<ul style="list-style-type: none"> • illustrates no understanding of problem. • It shows no consideration for need and potential user adaption. 	5%
	2. Goals and Objectives	A clear description of the project goals and objectives.	A good description of the project goals and objectives.	A fair description of the project goals and objectives.	A poor description of the project goals and objectives.	5%
	3. Timetable and Workplan	<ul style="list-style-type: none"> • All main activities events, millstones of the projects are set in the project timetable. • A solid workplan is provided with achievable project goals 	<ul style="list-style-type: none"> • Most of the main activities/events/milestones of the projects are set in the project timetable. • A good workplan is provided with achievable goals 	<ul style="list-style-type: none"> • Few of the main activities/events/millstones of the projects are set in the project timetable. • Weak workplan to achieve the project goals 	<ul style="list-style-type: none"> • None of the main activities/events/millstones of the projects are set in the project timetable. • No workplan is provided to achieve the project goals 	5%
Intermediate Report (15%)	1. Problem formulation	• A clear description of the problem formulation is provided.	• A good description of the problem formulation is provided.	• Some description of problem formulation is provided.	• No description of the problem formulation is provided.	5%
	2. Literature Survey	An excellent review for recent literature is provided	A good review for recent literature is provided	A fair review for recent literature is provided	No literature review is provided	5%
	3. Proposed Design/Solution	<ul style="list-style-type: none"> • A well-presented high-level view of major components of the system and their relationships with each other is illustrated. • A well description that refer to graphical representations of diagrams that are included 	<ul style="list-style-type: none"> • A good high-level view of major components of the system and their relationships with each other is illustrated. • A good description that refer to graphical representations of diagrams that are included 	<ul style="list-style-type: none"> • Some part of high-level view of major components of the system and their relationships with each other is illustrated. • Some description that refer to graphical representations of diagrams that are included 	<ul style="list-style-type: none"> • No high-level view of major components of the system and their relationships with each other is illustrated. • No description that refer to graphical representations of diagrams that are included 	5%

Final Report (30%)	1. Methodology	A clear and solid methodology on how to achieve the project deliverables is provided	A good realistic methodology on how to achieve the project deliverables is provided	Methodology is fairly described in the project	No methodology on how to achieve project deliverables is provided	10%
	2. Design issues,	<ul style="list-style-type: none"> Well defined design issues, constraints, assumptions, environmental implications and risk assessment and feasibility 	<ul style="list-style-type: none"> Good information on the design issues, constraints, assumptions, environmental implications and risk assessment and feasibility 	<ul style="list-style-type: none"> Some information on design issues, constraints, assumptions, environmental implications and risk assessment and feasibility 	No information on the design issues, constraints, assumptions, environmental implications and risk assessment and feasibility	10%
	3. Writing Quality and Using Standard template	<ul style="list-style-type: none"> Report is highly easy to read and understand organization of the overall report is highly coherent Excellent use of standard template All required elements of the report are included. 	<ul style="list-style-type: none"> Report is easy to read and understand organization of the overall report is coherent Good use of standard template Most required elements of the report are included. 	<ul style="list-style-type: none"> Report is fairly easy to read and understand organization of the overall report is fairly Coherent Little use of standard template Few required elements of the report are included. 	<ul style="list-style-type: none"> Report is not easy to read and understand organization of the overall report is Not coherent No use of standard template None of required elements of the report are included. 	10%
Oral Presentation (40%)	1. Subject Knowledge	Student explained and elaborated with full knowledge by answering all questions	Student explained and elaborate with knowledge by answering questions	Student tried to explain and elaborated with knowledge by answering questions	Student was not able to explain and elaborate with knowledge by answering questions	15%
	2. Teamwork	<ul style="list-style-type: none"> Student well fulfilled his roles and responsibilities. Student had excellent collaboration with his colleagues 	<ul style="list-style-type: none"> Student fulfilled most of his roles and responsibilities. Student had good collaboration with his colleagues 	<ul style="list-style-type: none"> Student fulfilled few of his roles and responsibilities. Student had fair collaboration with his colleagues 	<ul style="list-style-type: none"> Student didn't fulfill his roles and responsibilities. Student had bad collaboration with his colleagues 	10%
	3. Timeline	All requirements of the proposal were produced on time	Most of the proposal requirements were produced on time	Few of the proposal requirements were produced on time	None of the proposal requirements were produced on time	5%
	4. Presentation	Well delivery of oral presentation	Good delivery of oral presentation	Fair delivery of oral presentation	poor delivery of oral presentation	10%

Table 6: Assessment rubrics for Secondary Project (Supervisor).

	Category	Professional Quality “≥90”	Expected “80-89”	Acceptable “60-79”	Below Expectation “<60”	Score
Progress Report (20%)	1. Progress in achieving the initial goals	<ul style="list-style-type: none"> •Students finished all required goals up to date. •Students provided all initial outcomes required up to date. 	<ul style="list-style-type: none"> • Students finished most of the required goals up to date. • Students provided most of the initial outcomes required up to date. 	<ul style="list-style-type: none"> • Students finished few of the required goals up to date. • Students provided few of the initial outcomes required up to date. 	<ul style="list-style-type: none"> •None of the required goals up to date were finished. • Students didn't provide any initial outcomes required up to date. 	10%
	2. Plan for future actions and challenges	<ul style="list-style-type: none"> •Student well explained the next steps to achieve the goals of the project. •Students well stated the outstanding problems that could affect the development of the project. 	<ul style="list-style-type: none"> • Student explained the next steps to achieve the goals of the project. • Student stated the outstanding problems that could affect the development of the project. 	<ul style="list-style-type: none"> • Student tried to explain the next steps to achieve the goals of the project. • Students tried to state the outstanding problems that could affect the development of the project. 	<ul style="list-style-type: none"> • Student didn't explain the next steps to achieve the goals of the project. • Students didn't state the outstanding problems that could affect the development of the project. 	10%
Final Assessment (30%)	1. Subject Knowledge	Student explained and elaborated with full knowledge by answering all questions	Student explained and elaborate with knowledge by answering questions	Student tried to explain and elaborated with knowledge by answering questions	Student was not able to explain and elaborate with knowledge by answering questions	10%
	2. Design with multiple Constraints and Assessment of the design	<ul style="list-style-type: none"> •Student shows many new ideas and skills in solving the problem with multiple constraints •Excellent and innovative project design 	<ul style="list-style-type: none"> •Student shows ideas and design skills in solving the problem with multiple constraints •Very good project design 	<ul style="list-style-type: none"> •Student has difficulty showing design skills with multiple constraints •Good project design 	<ul style="list-style-type: none"> •Student was not able to create design •Poor project design 	10%
	3. Timeline	• All requirements of the project were produced on time	• Most of the project requirements were produced on time	• Few of the project requirements were produced on time	• None of the project requirements were produced on time	5%
	4. Teamwork	<ul style="list-style-type: none"> •Student well fulfilled his roles and responsibilities. •Student had excellent collaboration with his colleagues 	<ul style="list-style-type: none"> •Student fulfilled most of his roles and responsibilities. •Student had good collaboration with his colleagues 	<ul style="list-style-type: none"> •Student fulfilled few of his roles and responsibilities. •Student had fair collaboration with his colleagues 	<ul style="list-style-type: none"> •Student didn't fulfill his roles and responsibilities. •Student had bad collaboration with his colleagues 	5%

Table 7: Assessment rubrics for Secondary Project (PEC).

	Category	Professional Quality ">=90"	Expected "80-89"	Acceptable "60-79"	Below Expectation "<60"	Score
Final Report (20%)	1. Writing Mechanics and Writing Quality	<ul style="list-style-type: none"> Consistently correct use of grammar, punctuation, spelling, and mechanics All figures and tables neatly labeled with title Report is easy to read and understand Coherent organization of the overall report Writing is original and clear Excellent use of standard template All references are cited using appropriate format 	<ul style="list-style-type: none"> A few errors of grammar, punctuation, spelling, and mechanics Most figures and tables neatly labeled with title Report is average level to read and understand Organization of most sections is coherent Writing is original but unclear Good use of standard template Most references are cited using appropriate format 	<ul style="list-style-type: none"> Many errors of grammar, punctuation, spelling, and mechanics Some figures and tables neatly labeled with title Report is below average level to read and understand Organization of most sections is below average Writing is original but overused parentheses Fair use of standard template Few references are cited using appropriate format 	<ul style="list-style-type: none"> Inadequate use of grammar, punctuation, spelling, and mechanics Inadequate presentation of figures and tables Report is hard to read and understand Organization of most sections is poor Writing is Highly similar to other work Poor use of standard template No references are cited. 	10%
	2. Technical Quality	<ul style="list-style-type: none"> Goals are clearly stated All key comments from original plan are addressed in the revised plan Calculations can be followed easily without difficulty. Results are clearly reflecting the goals of experiment. Excellent evaluation of results 	<ul style="list-style-type: none"> Goals are partially stated Most key comments from original plan are addressed in the revised plan Calculations can be followed with difficulty. Most results are clearly reflecting the goals of experiment. Good evaluation of results 	<ul style="list-style-type: none"> Goals are poorly stated Some key comments from original plan are addressed in the revised plan Calculations can be followed with more difficulty. Few results are clearly reflecting the goals of experiment. Good evaluation of Results 	<ul style="list-style-type: none"> Goals are not stated Some key comments from original plan are addressed in the revised plan Calculations are difficult to follow Results do not reflect the goals of experiment. Poor evaluation of results 	10%
Final Oral Presentation (30%)	1. Organization	<ul style="list-style-type: none"> Excellent presentation and flow of information. Layout is Excellent; 	<ul style="list-style-type: none"> Very Good presentation and flow of information. Layout is Good; 	<ul style="list-style-type: none"> Good presentation and flow of information. Layout is Satisfactory 	<ul style="list-style-type: none"> Satisfactory presentation and flow of information. Layout is unsatisfactory; visuals inappropriate or distracting 	10%
	2. Knowledge/ Conclusions/ Q&A	<ul style="list-style-type: none"> Student explained and elaborated with full knowledge by answering all questions Clear, insightful conclusions; questions handled well 	<ul style="list-style-type: none"> Student explained and elaborate with knowledge by answering questions Most but not all points contained in the conclusion 	<ul style="list-style-type: none"> Student tried to explain and elaborated with knowledge by answering questions Adequate summary; few conclusion; questions & answers handled inexpertly 	<ul style="list-style-type: none"> Student was not able to explain and elaborate with knowledge by answering questions Inadequate summary; no conclusion; questions & answers handled unprofessionally 	10%
	3. Completeness	<ul style="list-style-type: none"> The provided Prototype/Solution covered all the goals of the project The provided prototype has been properly executed without problems. 	<ul style="list-style-type: none"> The provided Prototype/Solution covered most of the goals of the project The provided prototype/Solution has been properly executed with minor problems. 	<ul style="list-style-type: none"> The provided Prototype covered few of the goals of the project The provided prototype/Solution has been executed with major problems. 	<ul style="list-style-type: none"> The provided Prototype didn't cover any goals. No execution of the prototype/Solution. 	10%