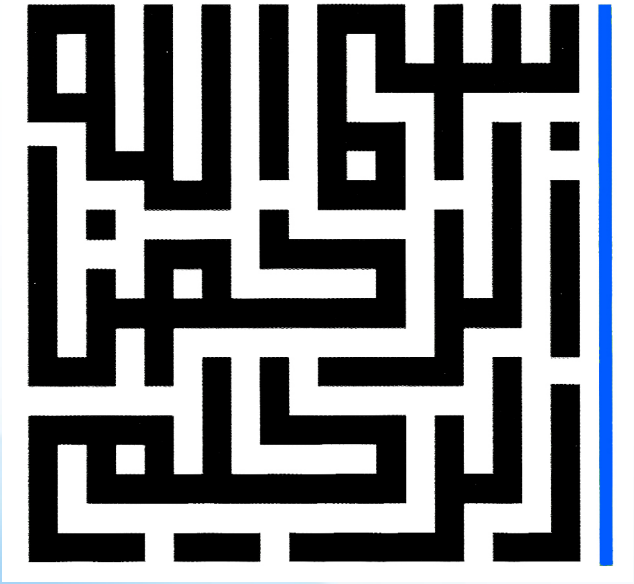
Umm Al-Qura University
University College – Jamoum
Computer Dept.

Graduation Project Handbook



In the Name of Allah,
the Most Gracious, the Most Merciful

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1. Graduation Project Course Description

The graduation project aims to let students develop projects that demonstrate their intellectual, technical and creative abilities. Students develop the projects under the direction and supervision of faculty members. Moreover, students gain lifelong learning skills and interface to real life applications. The main practical skills are related to software development processes. Specifically, students should practice project management, system restriction, system analysis and design, software implementation and testing, software development documentation and presentation, and project demonstration.

The graduation project is executed over two project courses in two semesters. These two courses are “Research Project” and “Graduation Project”.

The main objectives of first project course:

- Survey literatures to collect references of similar projects stating their strength and weakness.
- Develop project requirements, specification and initial design.

While the main objective of the other project course is to complete their designs, coding, implementation and testing of the first project course.

Students work in teams of three to five students under supervision of at least one faculty member. Students are encouraged to suggest their own projects and find faculty members that are willing to supervise them. Then, the department council discusses and approves/disapproves the student projects and their supervisors.

Upon the end of graduation projects, the student will be able to:

1. Apply knowledge of computing appropriate to the discipline.
2. Analyze a problem, and identify and define the computing requirements appropriate to its solution.
3. Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs.
4. Function effectively on teams to accomplish a common goal.
5. Understand professional, ethical, legal, security, and social issues.

6. Communicate effectively with a range of audiences.
7. Analyze the local and global impact of computing on individuals, organizations and society.
8. Use current techniques, skills, and tools necessary for computing practices.
9. Apply mathematical foundations, algorithmic principles, and computer theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
10. Apply design and development principles in the construction of software systems of varying complexity.

2. Overview of GP Process

The program has a year-long two-course (Research Project 2316519-4 and Graduation Project 2316539-4) capstone project that totals 8 credits. Students are required to work in teams of 3-5 students on a specific problem. In the first semester, teams focus on designing and developing a strong foundation for a solution to the problem. This includes surveying existing work, and developing a detailed design. In the second semester, teams focus on deep designing issues, implementation and evaluation of the solution. Each semester students are required to give a public oral presentation, and submit a significant written report. Each semester students should also submit weekly status reports, take minutes of meetings with their project supervisor, and develop and maintain a project management plan. Marks are distributed between project management, oral presentation, written technical reports and proposals, and other project outputs. Additionally, in the second semester a large portion of marks are given to a project demonstration where students demonstrate that their completed solution or prototype satisfies the project's requirements.

There are several courses preceding the graduation project courses and they are important in preparing students to the graduation project courses. Software engineering, database and web development courses play a major role in improving students' skills needed in their graduation projects. Therefore, practical projects are required in "Software Engineering," "System Analysis and Design," "Database Fundamentals," "Advanced Databases," "Web Programming" and "Internet Apps Development" courses.

3. Assigning Students to Supervisors and Projects

- A supervisor should be a full-time faculty member in the University College in Jamoum, Computer Science Department and may be assisted by an external supervisor in case of an industrial project.
- Students should form a group or team consisting of 3 to 5 students, depending on the total number of students and the availability of the faculty staff.
- In the semester prior to starting the GP, supervisors will be encouraged to submit their project ideas to the GP committee, which will be published to respective departmental website and similar publishing areas. Students can also contact with their earlier chosen supervisor and submit their own ideas.
- At the beginning of the project, an orientation session will be conducted to educate the prospective final year students, where this GP handbook will be presented and explained.
- The students formally register for the GP course in the 1st week of semester. They can start formally by submitting the Final Year Projects to the GP committee, throughout the 2nd week of the semester.
- The GP Coordinator, in coordination with each supervisor, is responsible to prepare a list of the proposed projects and supervisors.

4. Project Evaluation

4.1. GP Deliverables

The following table contains a minimal set of GP deliverables along with the purpose and the deadline of submission. The set of deliverables depends upon the nature of the project. Each deliverable is mandatory and alternate can be defined in consultation with the supervisor and the GP committee (at least a week before submission deadline). Each submitted deliverable should be duly signed by the supervisor. The submission without supervisor's approval will not be considered. Late submissions are liable to get penalty decided by GP Committee. The students may get a zero for a submission.

Project	Code	Deliverables	Description	Due Time	Evaluation
Research Project	R1	Project Proposal	To document the problem statement, need for the project, project scope and expected benefits	3rd week	Supervisor, Examiners
	R2	Project Management Plan	To document project development approach, associated milestones, agreed deliverables and dates	8th week	Supervisor
	R3	Project Requirement Specification	To document the agreed requirements, expected features, constraints, interfaces. This document is also supposed to provide the system design and modeling	10th week	Supervisor
	R4	Project Design Document	To document the design in order to provide the basis for implementation and unit test. Also describes the rationale for design decisions taken.	12th week	Supervisor
	R5	Final Report	To bind all project deliverables in the form of a single report.	14th week	Supervisor, Examiners
	R6	Final Presentation	To present all project deliverables.	15th week	Supervisor, Examiners
Graduation Project	G1	Project Proposal	To document the problem statement, need for the project, project scope and expected benefits	3rd week	Supervisor, Examiners
	G2	Project Design Document	To document the design in order to provide the basis for implementation and unit test. Also describes the rationale for design decisions taken.	6th week	Supervisor
	G3	Implementation Document	To document the implementation issues and input/output interfaces, and to explain how the system operates or how to use it.	10th week	Supervisor
	G4	Test Document	To document how the project will be tested, and record the results.	12th week	Supervisor
	G5	Final Report	To bind all project deliverables in the form of a single report.	14th week	Supervisor, Examiners
	G6	Final Presentation & Demo	To present all project deliverables and to demo of the project systems.	15th week	Supervisor, Examiners

4.2.Project Submission

Four copies of the bound report (one for boy's departmental library, one for girl's departmental library, one for examiner and one for supervisor)

- A CD (for the supervisor) comprising the following folders:
  - Report (soft copy of the final report, and power point presentation).
  - Code (complete source code of the project).
  - Demo (the executable in working order and a readme file containing the information about the software requirements (tools) and hardware requirements for the GP as well as the instructions or the steps (soft copy of the user manual) for running the GP executable).

4.3. GP Evaluation

- The department should form an evaluation committee.
- Examiners and supervisory committee are invited to evaluate students' projects. The GP Committee is responsible for scheduling final project presentation, which is a public event where students of the last semester before GP (sophomores) are encouraged to attend the event.
- Evaluation should be carried out according to the rubrics provided in section 6 (Grading Policy) and each project should be graded at least by three members of the evaluation committee.
- Plagiarism should be punished by scaling down students' marks by dissimilarity scores.

5. Evaluation Criteria

Following table explains a guideline for the criteria to be used for GP evaluation/assessment along with description and evaluation authority.

Criteria	Description	Evaluation Authority(s)
Process	To assess that student(s) have kept continuous contact during the work and have been on time both to meetings and in sending deliverables.	Supervisor
Presentation	To assess that student(s) have completed tasks and delivered documents expected in the research project. It includes both demonstration and presentation of the work.	Supervisor, Supervisory Committee
Proposal	To assess that the chosen project is worthy of being acceptable as a GP and if acceptable, register the project in the GP database.	Supervisory Committee
Project Demonstration	To assess the product developed in terms of interfaces, coding standards, and originality of the work. It requires student(s) to install project and run it for real time presentation.	Supervisor, Supervisory Committee, Examiner
Oral Presentation	To assess problem understanding, adequate analysis, quality of the design and presentation skills. Each group is required to discuss the completeness and accomplishment of the project.	Supervisor, Supervisory Committee, Examiner
Project Report	To assess the structure of the project report. Student(s) are required to show planning and progress in an organized way with emphasis on the interpretation of the information gathered during the project. Project reports should be submitted in both projects.	Supervisor, Examiner

There is a map between project deliverables and rubrics to outcomes assessment as shown in the following table.

Outcome	Proposal, Process, Presentation and Report Parts
SOa	Initial Systems Specification / External Design
SOb	Final Specifications / Internal Design

Outcome	Proposal, Process, Presentation and Report Parts
SOc	System Diagrams and System Constraints
SOd	Team Work
SOe	Project Impact
SOf	Introduction/Executive Summary/Presentation
SOg	Project Contributions
SOi	Detailed Design and Implementation
SOj	System Design
SOk	Implementation and System Constraints

The GP committee is responsible for collecting and improving the project courses folders including the assessment reports. The assessment project results have been included in the previous shown direct and indirect assessment results.

6. Grading Policy

Each project has a rubric for marking students' activities as shown in the following table.

Rubric	Criteria	Marks (100)
GP Proposal	Style, Content, Language, Structure, Completeness	10
GP Process	Regularity, Independence	20
GP Presentation	Knowledge, Organization, Contents, Presentation, Completeness	30
GP Report	Style, Contents, Language, Structure, Completeness, Technical	40

Recommended scales for each criterion are shown in the following tables:

GP Process Rubric					
Criteria	4 -Superior command	3 – Good control	2 – Fair/some control	1 – Minimal/no control	Marks
Regularity	Student has kept continuous contact during the work and has been on time both to meetings and in sending deliverables.	Student has mostly sent deliverables on agreed dates. With only a few exceptions, student(s) have been on time to meetings and in reporting their progress.	Student has been late to meetings or in sending deliverables in a way that have hampered the process. The Supervisor had to prompt the students with questions about the status of the work.	Student has a serious problem with keeping agreed to meeting and deadlines. Supervisor has not been able to get a picture of the status of the work during the project.	/4
Independence	Student has independently managed the project and carried out the work.	Student has managed the project and carried out the work with some help from the supervisor.	Supervisor has given a lot of help to the students in managing the project and carrying out the work.	Supervisor had to manage the project and direct the students in carrying out the work.	/4
Total	(Regularity * 3 + Independence * 2)				

GP Process Rubric					
Criteria	4 -Superior command	3 – Good control	2 – Fair/some control	1 – Minimal/no control	Marks
Style	Preliminary pages are as required. Tables and figures have the proper captions. Complete references are given	Preliminary pages are as required. The tables and figures have the proper captions. Adequate references are given	Preliminary pages are as required. Title of tables and figures can be improved. References are given occasionally	Preliminary pages are not as required. Improper caption of tables and figures. References are incomplete and incorrect	/4
Content	Material content is clear and concise. Accurate details are present to support the main idea. Significant points are well identified	Material content is clear and appropriate. Some details are present to support the main idea. Significant points are identified	Material content is Appropriate. Some details are present to support the main idea. Some of the significant points are identified	Material lacks the relevant content. Details lack a clear connection to the purpose. Everything seems as important as everything else.	/4

Language	There are no errors that impair the flow of communication. Perfect with <5 errors	Occasional errors that have only minor impact on flow of communication. Good with <10 errors	Frequent errors that impede the flow of communication. Ok with <15 errors.	Errors are serious and numerous. Reader should stop and reread and may struggle to discern the writer's intention. Multiple, serious errors.	/4
Structure	Document is efficiently organized in a logical order. Well-balanced graphical representation further enhances the central theme	Document is adequately organized in a logical order. Graphical representation can be improved to further enhance the central theme	Logical organization can be improved. Graphical representation can be improved to further enhance the central theme	Document is not organized in a logical order and is difficult to follow	/4
Completeness	Complete, accurate description of important outcomes	Incomplete, accurate description of important outcomes	Complete, inaccurate description of important outcomes	Incomplete, inaccurate description of important outcomes	/4
Total	(Style + Content + Language + Structure + Completeness)/2				/10

GP Process Rubric					Marks
Criteria	4 -Superior command	3 – Good control	2 – Fair/some control	1 – Minimal/no control	
Knowledge	Student has presented full knowledge of both problem and solution. Answers to questions are strengthen by rationalization and explanation	Student has competent knowledge and is at ease with information. Can answer questions but without rationalization and explanation	Student is uncomfortable with information. Seems Novice and can answer basic questions only.	Student has no or very less knowledge of both problem and solution. Cannot answer questions	/4

	Information articulated clearly and is organized in a structured way with logical flow between parts	Information articulated clearly but the flow is somewhat hampered	Information articulated clearly but it is difficult to follow the presentation	Information is arranged in confused and unstructured way	/4
Contents	All key points are covered. Enhances presentation and keeps interest by effective use of charts, graphs, figures etc., to explain salient points	All key points are covered but limited use of charts, graphs, figures etc., to explain salient points	All key points are covered but no use of charts, graphs, figures etc., to explain salient points	Key points are not covered. Poor, distracts audience and is hard to understand/interpret	/4
Presentation	Student confidence is noteworthy. Builds trust and holds attention by direct eye contact and natural hand gesture adopted to the content	Student confidence is good. Holds attention by consistent use of direct eye contact with audience	Student confidence is Ok. Only focuses on one part of the audience. Does not scan audience	Student lacks confidence. Does not attempt to look at audience at all. Reads notes or looks at computer screen only	/4
Completeness	Complete, accurate description of important outcomes	Incomplete, accurate description of important outcomes	Complete, inaccurate description of important outcomes	Incomplete, inaccurate description of important outcomes	/4
Total	(Knowledge + Organization + Contents + Presentation + Completeness) x 1.5				/20

GP Process Rubric					Marks
Criteria	4 -Superior command	3 – Good control	2 – Fair/some control	1 – Minimal/no control	
Style	Preliminary pages are as required. Tables and figures have the proper captions. Complete references are given	Preliminary pages are as required. The tables and figures have the proper captions. Adequate references are given	Preliminary pages are as required. Title of tables and figures can be improved. References are given occasionally	Preliminary pages are not as required. Improper caption of tables and figures. References are incomplete and incorrect	/4

Contents	Material content is clear and concise. Accurate details are present to support the main idea. Significant points are well identified	Material content is clear and appropriate. Some details are present to support the main idea. Significant points are identified	Material content is Appropriate. Some details are present to support the main idea. Some of the significant points are identified	Material lacks the relevant content. Details lack a clear connection to the purpose. Everything seems as important as everything else.	/4
Language	There are no errors that impair the flow of communication. Perfect with <5 errors	Occasional errors that have only minor impact on flow of communication. Good with <10 errors	Frequent errors that impede the flow of communication. Ok with <15 errors.	Errors are serious and numerous. Reader should stop and reread and may struggle to discern the writer's intention.	/4
Structure	Document is efficiently organized in a logical order. Well-balanced graphical representation further enhances the central theme	Document is adequately organized in a logical order. Graphical representation can be improved to further enhance the central theme	Logical organization can be improved. Graphical representation can be improved to further enhance the central theme	Document is not organized in a logical order and is difficult to follow	/4
Completeness	Complete, accurate description of important outcomes	Incomplete, accurate description of important outcomes	Complete, inaccurate description of important outcomes	Incomplete, inaccurate description of important outcomes	/4
Technical	Requirements and specification is technically sound and provides state of the art in terms of technical details.	The report does include a fair amount of detail about requirements and specification.	The report provides a shallow overview of requirements and specification.	The report gives little to no detail about requirements and specification.	/4
Total	(Style + Contents + Language + Structure + Completeness + (Technical * 5))				/40

7. Project Template Guidance

7.1.Front Materials

- Cover Pages
- Title Page
- Contact Information
- Intellectual Property Right Declaration
- Anti-Plagiarism Declaration
- Acknowledgement
- Abstract
- Table of Contents

7.2. GP Report Chapters

Chapter 1. INTRODUCTION

1.1 Purpose of the Project
1.2 Problem Definition
1.3 Overview of the Project Document
1.4 Existing Systems

Chapter 2. SYSTEM ANALYSIS

2.1 Data Modeling Diagrams
2.2 System Requirements
2.2.1 Clients, Customer and Users
2.2.2 Functional and Data Requirements
2.2.3 Non-functional Requirements
2.2.3.1 Look and Feel Requirements
2.2.3.2 Usability Requirements
2.2.3.3 Security Requirements

6.3.n.3 Expected Outputs & Pass/Fail criteria
6.3.n.4 Test Procedure

Chapter 7. CONCLUSIONS

REFERENCES

GLOSSARY

APPENDICES
User Manual
Code Listing
Testing Results
Additive Appendices

ATTACHMENTS
CD containing the Project and its Code

8. Project Management Plan

The student should design a management plan of their project distributed over the whole mester according to the deliverables timetable.

9. Project Poster

The students prepare a Poster of size A2 or A1 which are placed on an open display and a reviewed by the Supervisory Committee.