Final Year Project (FYP) Manual

for the Bachelor of Computer Science

2024

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جامعة القصيم

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Preface:

The Final Year Project (FYP) consists of two consecutive capstone courses across all programs within the College of Computer at the Qassim University. It is designed to bridge the gap between theoretical knowledge gained throughout the Computer Science (CS) program with practical applications in real-world scenarios. Additionally, it provides a platform for nurturing management skills, entrepreneurial thinking, and expertise in scientific and applied research methodologies.

Aligned with the Vision and Mission of the CS Program, these guidelines have been developed to assist both students and faculty in effectively managing the FYP process. They aim to ensure the successful completion of the project with the highest quality standards while achieving the intended educational and professional objectives.

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1. FYP Structure and Objectives

According to the BSc CS study plan, the Final Year Project comprises two interrelated courses: CS498 (FYP Phase 1) and CS499 (FYP Phase 2). These courses are conducted over two consecutive semesters (Level 9 and 10) and collectively carry a total of 5 (2+3) credit hours.

These courses equip students with essential skills in scientific research, literature review, research methodologies, scientific writing, and other competencies necessary to complete a graduation project in the field of Computer Science. The curriculum encompasses defining the problem statement and its significance, proposing a solution, identifying requirements and performing analysis, designing the system architecture and user interface, as well as implementing and testing the proposed solution. Figure 1 shows the graduation project's development cycle.

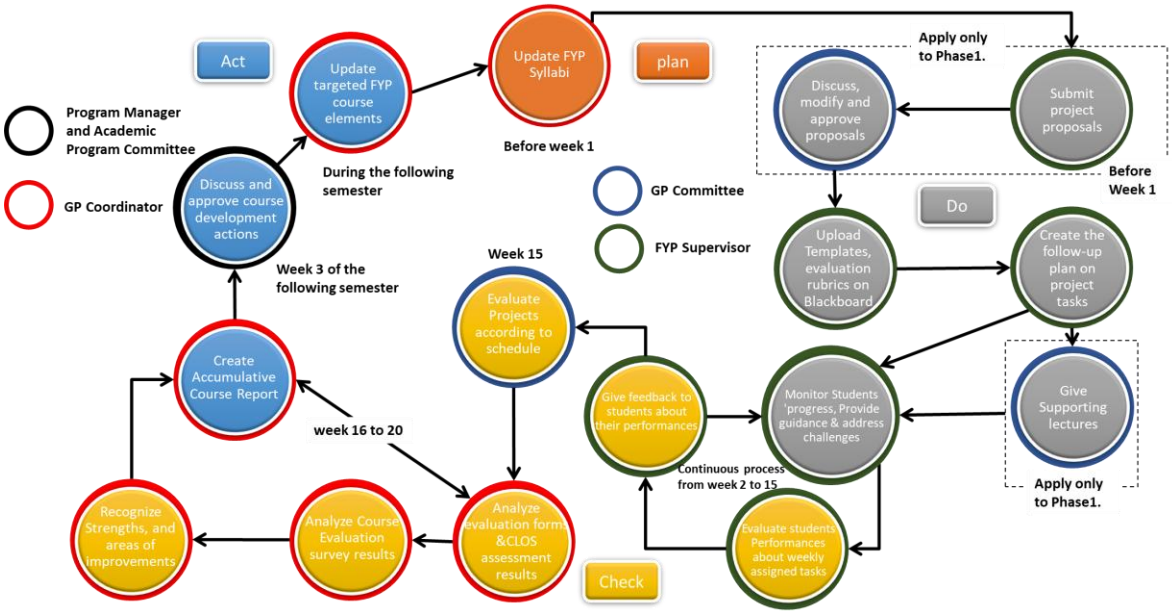

Figure 1: Final Year projects 1, 2 courses development cycle

1.1. Prerequisites

The students can register for the FYP courses: CS498 and CS499, after they have completed most of the major CS courses. Table 1 shows the prerequisite courses for CS498 and CS499.

TABLE 1: PREREQUSITES FOR FYP COURSES

FYP Course	Prerequisites
CS498	Students must complete 100 credit hours in order to register for CS498
CS499	CS498

1.2. SUPPORTING WORKSHOPS FOR CS498

During Phase 1 of the FYP, the program provides structured support through six dedicated workshops. These lectures cover all phases of project development, including problem formulation, project planning, conducting a thorough literature review, following the ethics, along with written and presentation skills. During the sessions, the templates for project deliverables are presented and explained to students. The workshops are spanned over six weeks and are given by different male and female faculty members. The selection of the faculty members is done by the GP committee. Table 2 shows the list of topics for the workshops.

TABLE 2: SUPPORTING WORKSHOPS FOR CS498

Week	Title of the Workshop
3	Problem Formulation, Initial Project Specifications, and Project Constraints & Standards
4	Project Planning, Time Management, and Project Team
5	Literature Review & Referencing
6	Ethics and Plagiarism
7	FYP Report Writing and Structure

8	Effective Presentation Skills

1.3. MARKS DISTRIBUTION FOR CS498

The marks distribution of CS498 is provided in Table 3. Fifteen marks are reserved for the supporting workshops which are given by different male and female faculty members. The selection of the faculty members is done by the GP committee.

TABLE 3: MARKS DISTRIBUTION – CS498

	Marks
Supervisor	40
Examiner(s)	30
Supporting Workshops	15
Submission & Project Activities	15
Total	**100**

1.4. MARKS DISTRIBUTION FOR CS499

The marks distribution of CS499 is given in Table 4.

TABLE 4: MARKS DISTRIBUTION – CS498

	Marks
Supervisor	45
Examiner(s)	30
Exit Exam	5
Submission & Project Activities	15
Total	**100**

2. FYP LEARNING OUTCOMES

Upon completing the Final Year Project, the students will enhance their theoretical and practical foundation from various perspectives, including their knowledge, experience, management abilities, and communication skills. The following highlights the learning outcomes of the two FYP courses.

2.1. CS498 Course Learning Outcomes (CLOs)

The CLOs for CS498 are given in Table 5.

TABLE 5: COURSE LEARNING OUTCOMES (CLO) FOR CS498

Code	Course Learning Outcomes	Aligned PLO
1.0	**Knowledge and Understanding**	
1.1	Recognize processes that support the delivery and management of software production such as analysis, design, implementation, and maintenance.	**K2**
1.2	Define the knowledge of software project management in all areas such as scope, time, quality, etc. and the process groups in different project phases including initiation, planning, execution, control, and close out	**K2**
2.0	**Skills**	
2.1	Communicate effectively the problem definition, proposed solution, and preliminary system design to a range of audiences.	**S1**
2.2	Analyze a problem, find a solution, identify and define the functional and nonfunctional requirements appropriate to its solution.	**S2**
2.3	Formulate the design of the project	**S3**
2.4	Apply current techniques, skills and tools necessary for software project management and system development, such as WBS, Gantt Chart, Use Case Diagram, and ER diagram.	**S4**
3.0	**Values, autonomy, and responsibility**	
3.1	Function effectively as a member of a team engaged to accomplish the project.	**V1**
3.2	Recognize the professional, ethical, legal, security and social issues and responsibilities.	**V2**

2.2. CS499 CLOs

The CLOs for CS499 are given in Table 6.

TABLE 6: COURSE LEARNING OUTCOMES (CLO) FOR CS499

Code	Course Learning Outcomes	Aligned PLO
1.0	**Knowledge and Understanding**	
1.1	Recognize processes that support the delivery and management of software production such as analysis, design, implementation, and maintenance.	**K2**
1.2	Define the knowledge of software project management in all areas such as scope, time, quality, etc. and the process groups in different project phases including initiation, planning, execution, control, and close out	**K2**
2.0	**Skills**	
2.1	Communicate effectively through detailed presentations, reports, and demonstrations of the project's results and contributions.	**S1**
2.2	Solve complex problems during implementation and refine requirements to ensure alignment with project goals.	**S2**
2.3	Design, implement, and evaluate a comprehensive computing-based solution that meets the project's objectives.	**S3**
2.4	Utilize advanced tools and technologies for implementation, testing, debugging, and deployment of the developed solution.	**S4**
3.0	**Values, autonomy, and responsibility**	
3.1	Function effectively as a member of a team engaged to accomplish the project.	**V1**
3.2	Recognize the professional, ethical, legal, security and social issues and responsibilities.	**V2**

The course learning outcomes (CLOs) of Final Year Project courses are essential for evaluating the Program Learning Outcomes (PLOs) of the Computer Science (CS) program. By aligning specific CLOs with broader PLOs, instructors can effectively assess how well students meet the program's objectives. This alignment offers clear evidence of students' knowledge, skills, and values, ensuring they are well-equipped to tackle professional challenges in the field of Computer Science. The detailed information about the CS PLOs and the CLO-PLO mapping process can be found at the following links (Program Specification, Course Specification). Table 7 shows the mapping between

the Grade Rubrics covering different Student Outcomes (SOs) and the CLOs for CS498. Table 8 provides the same mapping for CS499.

TABLE 7: MAPPING BETWEEN GRADE RUBRICS COVERING STUDENT OUTCOMES AND COURSE LEARNING OUTCOMES FOR CS498

Grade Rubrics	SO	CLO
Clarity in Problem Definition with Proper Justifications (including Background, Literature Review, Requirement Specifications, Surveys, etc.)	**1**	Analyze a problem, find a solution, identify and define the functional and nonfunctional requirements appropriate to its solution. **(S2)**
Justification of Proposed Solution	**1, 6**	Recognize processes that support the delivery and management of software production such as analysis, design, implementation, and maintenance. **(K2)** Define the knowledge of software project management in all areas such as scope, time, quality, etc. and the process groups in different project phases including initiation, planning, execution, control, and close out. **(K2)** Apply current techniques, skills, and tools necessary for software project management and system development, such as WBS, Gantt Chart, Use Case Diagram, and ER diagram. **(S4)**
System Design	**2, 6**	Recognize processes that support the delivery and management of software production such as analysis, design, implementation, and maintenance. **(K1)** Define the knowledge of software project management in all areas such as scope, time, quality, etc. and the process groups in different project phases including initiation, planning, execution, control, and close out. **(K1)** Formulate the design of the project. **(S3)** Apply current techniques, skills, and tools necessary for software project management and system development, such as WBS, Gantt Chart, Use Case Diagram, and ER diagram.

		(S4)
Team Work / Project Plan / Coordination	**5**	Function effectively as a member of a team engaged to accomplish the project. **(V1)**
Report Formatting based on College Template	**5**	Function effectively as a member of a team engaged to accomplish the project. **(V1)**
Report Contents and English Language	**4, 5**	Function effectively as a member of a team engaged to accomplish the project. **(V1)** Recognize the professional, ethical, legal, security, and social issues and responsibilities. **(V2)**
Importance of the Project Idea in the Real World	**4**	Recognize the professional, ethical, legal, security, and social issues and responsibilities. **(V2)**
Selection of Tools for Design	**6**	Recognize processes that support the delivery and management of software production such as analysis, design, implementation, and maintenance. **(K1)** Define the knowledge of software project management in all areas such as scope, time, quality, etc. and the process groups in different project phases including initiation, planning, execution, control, and close out. **(K1)** Apply current techniques, skills, and tools necessary for software project management and system development, such as WBS, Gantt Chart, Use Case Diagram, and ER diagram. **(S4)**
Presentation / Discussion	**3**	Communicate effectively with a range of audience. **(S1)**
Overall Performance	**5**	Function effectively as a member of a team engaged to accomplish the project. **(V1)**

TABLE 8: MAPPING BETWEEN GRADE RUBRICS COVERING STUDENT OUTCOMES AND COURSE LEARNING OUTCOMES FOR CS499

Grade Rubrics	SO	CLO
Clarity in Problem Definition with Proper Justifications (including Background, Literature Review, Requirement Specifications, Surveys, etc.)	**1**	Analyze a problem, find a solution, identify and define the functional and nonfunctional requirements appropriate to its solution. **(S2)**
Understanding of Program Structure and Implemented Code	**1, 2, 6**	Recognize processes that support the delivery and management of software production such as analysis, design, implementation, and maintenance. **(K2)** Define the knowledge of software project management in all areas such as scope, time, quality, etc. and the process groups in different project phases including initiation, planning, execution, control, and close out. **(K2)** Formulate the design of the project **(S3)** Apply current techniques, skills, and tools necessary for software project management and system development, such as WBS, Gantt Chart, Use Case Diagram, and ER diagram. **(S4)**
Results and Discussion	**2, 6**	Recognize processes that support the delivery and management of software production such as analysis, design, implementation, and maintenance. **(K2)** Define the knowledge of software project management in all areas such as scope, time, quality, etc. and the process groups in different project phases including initiation, planning, execution, control, and close out. **(K2)** Apply current techniques, skills, and tools necessary for software project management and system development, such as WBS, Gantt Chart, Use Case Diagram, and ER diagram. **(S4)**
Team Work / Project Plan / Coordination	**5**	Function effectively as a member of a team engaged to accomplish the project.

		(V1)
Report Formatting based on College Template	**5**	Function effectively as a member of a team engaged to accomplish the project. **(V1)**
Report Contents and English Language	**4, 5**	Function effectively as a member of a team engaged to accomplish the project. **(V1)** Recognize the professional, ethical, legal, security, and social issues and responsibilities. **(V2)**
Identification of Possible Enhancement of the Project in Future	**4**	Recognize the professional, ethical, legal, security, and social issues and responsibilities. **(V2)**
Selection of Tools for Implementation, Testing, and Analysis	**6**	Recognize processes that support the delivery and management of software production such as analysis, design, implementation, and maintenance. **(K2)** Define the knowledge of software project management in all areas such as scope, time, quality, etc. and the process groups in different project phases including initiation, planning, execution, control, and close out. **(K2)** Apply current techniques, skills, and tools necessary for software project management and system development, such as WBS, Gantt Chart, Use Case Diagram, and ER diagram. **(S4)**
Presentation / Demonstration	**3**	Communicate effectively with a range of audience. **(S1)**
Overall Performance	**5**	Function effectively as a member of a team engaged to accomplish the project. **(V1)**

3. KEY STAKEHOLDERS AND THEIR ROLES

The primary stakeholders of the Final Year Project include students, supervisors, CS498/CS499 course coordinator, examiners, and the GP committee.

3.1. Role of the Students

Students are central stakeholders who are actively involved throughout the duration of the Final Year Project, taking primary responsibility for its progress and successful completion. Typically, project teams consist of four students under the guidance of a supervisor. The FYP is designed to foster student autonomy and instill a strong sense of responsibility. As such, students are expected to show full dedication. The quality of the FYP outcomes directly reflects their commitment and academic capabilities. The key responsibilities assigned to students include:

- Adhering to the department's guidelines for the project process and documentation
- Upholding academic integrity throughout the project
- Selecting a group leader to manage the team and defining the roles and responsibilities of each member, ensuring all students are familiar with every aspect of the project, even those outside their specific responsibilities
- Regularly updating the supervisor on project progress and any challenges encountered
- Collaboratively planning the project timeline with the supervisor
- Actively attending and participating in weekly meetings with the supervisor
- Seeking the supervisor's guidance on both scientific and technical matters
- Submitting all required forms, reports, and documents within the specified deadlines
- Participating in various events related to the FYPs
- Reporting any special issues to the supervisor or FYP course coordinator, who will then escalate the matter to the GP Committee and the Head of the Department, if necessary

3.2. Role of the Supervisor

All PhD holder faculty members in the CS department are eligible to supervise Final Year Projects (FYP) within their area of expertise. The supervisors play a vital role in guiding students throughout the course of their projects. The responsibilities of the supervisor include:

- Conducting weekly meetings with students to monitor their progress and completing meeting forms
- Discussing the project scope, objectives, and timeline with the students
- Reviewing and providing feedback on the report as needed, without being responsible for major editing of the report or code
- Finding the similarity of the students' report and ensuring that it is having less than 20% match with different sources
- Identifying students' weaknesses and assisting them in overcoming these challenges over the course of the project
- Responding to requests from FYP course coordinators
- Familiarizing themselves with the FYP guidelines and ensuring that students adhere to them
- Reporting instances of dishonesty by students to the FYP coordinator
- Evaluating each student individually based on their contributions to the project
- Collaborating with FYP course coordinators and the GP Committee to communicate with students and address various requirements, such as surveys or nominations for competitions
- Arranging the final defense in consultation with the examiner and the students

3.3. Role of the Examiner

Examiners are faculty members responsible for evaluating students' FYPs. Typically, examiners are assigned projects based on their areas of interest. The examiners are chosen by the GP Committee and the final list is approved by the HoD. Once assigned to a project, examiners are expected to:

- Thoroughly review the project report

- Evaluate both the code and the report in detail
- Offer constructive feedback and critique the work to enhance its quality

3.4. Role of the GP Committee and GP Coordinator

The GP Committee is tasked with coordinating and managing FYP activities within the department. It is composed of faculty members appointed by the department head, with the committee head responsible for overseeing the committee's operations.

The committee functions under the administrative oversight of the college-level GP committee, which plays a key role in supervising and supporting department-level committees. This hierarchical structure ensures that department committees receive adequate support, adhere to college-wide standards, and effectively guide students in successfully completing their FYPs.

The responsibilities of the committee include the following:

- Review and update the department's FYP procedures and guidelines, ensuring alignment with the two FYP courses. Any changes to guidelines, procedures, or forms must receive approval from the quality committee
- Approve FYP ideas to ensure they meet departmental standards
- Address and resolve conflicts between students and supervisors
- Approve supervisors' requests for modifications to FYP objectives
- Nominate projects for participation in local, national, and international events
- Approve the schedules and the examiners for FYP examinations
- Streamline FYP processes by publishing lists of deliverables and tasks along with their respective deadlines
- Approve topics for FYPs
- Act as the primary point of contact for resolving disputes related to FYPs

4. FYP Timeline

As outlined earlier, the FYP spans two semesters, with several stages in each semester. This section provides an overview of these stages, their timelines, deliverables, and the responsible parties.

4.1. CS498 Completion Timeline

The first phase of the FYP is divided into four primary stages: group formation, project proposal process, document preparation, and discussion and evaluation.

4.1.1. Group Formation

Students are responsible for forming their own groups. If any students are unable to find a suitable group, the GP Committee will assist by assigning them to other groups based on shared interests in the approved FYP ideas. Each group should comprise of two to six students. The department may determine the appropriate number of students in each group in exceptional cases.

4.1.2. Project Proposal Process

The project proposal process consists of four steps: project assignment, approval of the proposal, writing the project report, and the FYP discussion.

1. **Project Assignment:**
   There are two approaches for assigning FYP proposals to student groups:
   - Student-Initiated Approach: Students are encouraged to present their project ideas to faculty members to identify a potential supervisor. Once a supervisor is selected, they collaborate with the students to develop a proposal based on the project's outlined scope.
   - Supervisor-Initiated Approach: Faculty members propose project ideas without assigning them to specific groups. All proposed ideas are made available to CS498 students, allowing them to choose a project that aligns with their interests. Each proposal must follow the prescribed format.
2. **Approval of the Proposal:**

The committee assesses each proposal based on predefined criteria established by the program committee. Following the evaluation, proposals are either approved, rejected, or returned for revisions as necessary.

4.1.3. WRITING THE PROJECT REPORT

In this phase, students focus on developing the FYP report, which includes several critical components. The introduction provides a concise overview of the project's purpose and objectives, setting the foundation for the project report. Next, the background section explores the contextual framework, presenting relevant theories and prior research to establish a solid foundation. The data collection and analysis section follow, detailing the methodologies used and the insights obtained, reflecting a systematic research approach. Finally, the application design section outlines the proposed solution, including the conceptual framework and technical specifications. Together, these elements create a comprehensive document that highlights the students' academic knowledge and practical skills.

4.1.4. CS498 PROJECT DISCUSSION

At the end of each semester, Graduation Project discussions are held, lasting approximately 30–40 minutes. The discussion schedule is shared with students, supervisors, and examiners in advance. Prior to the discussions, students must submit their project report and presentation to the supervisors which are then sent to the examiners. The evaluations are conducted by supervisors and examiners, based on the quality of the project report, the students' oral communication skills during the presentation, and their overall performance in meeting all deliverables throughout the semester.

4.2. CS499 COMPLETION TIMELINE

CS499 is automatically registered for students, provided they have successfully completed CS498. This phase involves several key stages that are essential for

completing the graduation project in entirety. These stages are designed to showcase the students' ability to apply their academic knowledge to address real-world challenges.

4.2.1. Application Implementation and Testing

In this stage, students develop the proposed solution outlined in CS498, utilizing their technical skills to build software or implement solutions based on the nature of their project. Once the application is developed, it undergoes comprehensive testing to ensure it performs as intended. Various testing methods, such as black-box and white-box testing, unit testing, integration testing, and user acceptance testing, are conducted. The outcomes of these tests are thoroughly documented and analyzed to identify and resolve any issues.

4.2.2. Writing and Completing the Project Report

Alongside implementation and testing, students continue refining the documentation of their project. This includes updating the project plan, detailing the implementation process, and recording any modifications made to the original design based on testing outcomes. There can be occasional cases of updating the literature review.

4.2.3. Final Project Presentation

Students present their project to their supervisor and examiners, highlighting the problem they addressed, their proposed solution, the implementation process, testing results, and the overall impact of their work. This presentation provides students with an opportunity to demonstrate their expertise, skills, and the significance of their contributions. Different questions are asked by the examiners and the responses are evaluated.

5. Graduation Project Exhibition and Contest

At the end of each academic year, an exhibition is organized for the students undergoing Phase 2 (CS499), providing students with a platform to showcase their projects through well-designed posters (the poster template is provided in Section 9). This event offers an opportunity for students to present their research, methodologies, findings, and practical applications to their peers and esteemed faculty members. In addition to fostering

intellectual exchange, the exhibition includes a competition where participants can vie for monetary awards. This competitive element not only celebrates academic achievements but also incentivizes excellence, encouraging a spirit of innovation and collaboration among students. The annual showcase is a testament to the hard work of graduating students, contributing to a sense of pride and camaraderie within the academic community.

6. Conflict Resolution

In the event of a dispute or an issue, students are encouraged to seek guidance from their supervisor or course coordinator. These parties, in turn, consult with the department head and the GP Committee to find a mutually agreeable solution that ensures the successful completion of the graduation project.

7. Copyright and Intellectual Property Rights

Upon completing the graduation project, students must submit all deliverables and outputs, including software, hardware, project data, source code, and detailed instructions (e.g., README or how-to documentation), to their supervisors. According to the operational rules for intellectual property policies at the university, the institution holds the copyright and intellectual property rights to all student work. Any tangible or intangible benefits derived from the projects, such as publications, patents, or financial proceeds, must be distributed among the students, their supervisor, and the university. This distribution should align with the department's policies and comply with the university's intellectual property regulations.

8. Academic Integrity and Plagiarism

Academic integrity embodies the commitment to pursuing and presenting learning and scholarship in an honest, transparent, and respectful manner, emphasizing personal responsibility, originality, and proper attribution. Plagiarism, a specific violation of academic integrity, occurs when someone presents another person’s work, words, ideas, or thoughts as their own.

Plagiarism includes, but is not limited to, copying content or using ideas from articles, books, unpublished papers, or online sources without proper citation or failing to enclose quoted material in quotation marks. It also involves paraphrasing too closely to the original source, often by simply substituting synonyms without adequate rephrasing.

Any instances of academic integrity violations or plagiarism will be addressed by the Supervisor and the Graduations Project Committee and reported to the College GP Committee, which will determine the appropriate course of action.

9. Graduate Project Forms and Templates

All required FYP forms, templates, and Blackboard packages are officially communicated and made accessible to both supervisors and students. This structured approach ensures that comprehensive documentation is available to support efficient communication, coordination, and project management. Throughout the semester, the GP Committee conducts regular check-ins to ensure that all groups and supervisors maintain consistent contact and that the progress and execution of projects are proceeding smoothly.

CS498 Report Template		CS499 Report Template	
CS498 Presentation Template		CS499 Presentation Template	
CS498 Course Specifications		CS499 Course Specifications	

Supervisor Evaluation Form for CS498		Examiner Evaluation Form for CS498	
Supervisor Evaluation Form for CS499		Examiner Evaluation Form for CS499	
Poster Template		Exit Exam (Oral Exam)	


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