



**Mehran University of Engineering & Technology**  
**Department of Software Engineering**

**Final Year Project Guidelines**

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## 1.1 INTRODUCTION

The Final Year Project (FYP) is the culmination of students' degree program. The main purpose of this project is to encourage students to apply the knowledge acquired during their studies. It allows them to work on a substantial problem for an extended period of time, show how proficient they are in solving real world problems. It brings them a sound opportunity to demonstrate their competence as professionals and to apply what they have learnt in the other components of the degree. Besides, they get a chance to improve their technical skills, communication skills by integrating writing, presentation and learn how to work in teams. With a real-world problem at hand, they get to learn professional practice and a variety of non-technical issues such as management, finance, safety, reliability, environment and social impacts. Moreover, it provides an integrated assessment of the progress of the students toward the training they went through during their academic tenure at the college.

FYP course is different other courses because it demands independent objective formulation, planning, management and self-motivation. It is therefore essential to design fair and comprehensive guidelines for the students, supervisors and the evaluators. A structured manual and lifecycle process is therefore essential in order to help students conform to the required quality standards, outline general expectations from the supervisors and sketch assessment criteria for the evaluators. Hence, contribute as a fundamental underpinning to achieve high quality learning outcomes of the projects.

## 1.2 DEGREE PROGRAM LEARNING OUTCOMES (PLOS)

Program Learning Outcomes are the narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the knowledge, skills and attitude that the students acquire while progressing through the program. The program must demonstrate that by the time of graduation the students have attained a certain set of knowledge, skills and behavioral traits, at least to some acceptable minimum level. Specifically, it is to be demonstrated that the students have acquired the following graduate attributes:

- (i) **Engineering Knowledge:** An ability to apply knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

- (ii) **Problem Analysis:** An ability to identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
- (iii) **Design/Development of Solutions:** An ability to design solutions for complex engineering problems and design systems, components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- (iv) **Investigation:** An ability to investigate complex engineering problems in a methodical way including literature survey, design and conduct of experiments, analysis and interpretation of experimental data and synthesis of information to derive valid conclusions.
- (v) **Modern Tool Usage:** An ability to create, select and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modeling, to complex engineering activities, with an understanding of the limitations.
- (vi) **The Engineer and Society:** An ability to apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice and solution to complex engineering problems.
- (vii) **Environment and Sustainability:** An ability to understand the impact of professional engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.
- (viii) **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
- (ix) **I ndividual and Team Work:** An ability to work effectively, as an individual or in a team, on multifaceted and /or multidisciplinary settings.
- (x) **Communication:** An ability to communicate effectively, orally as well as in writing, on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- (xi) **Project Management:** An ability to demonstrate management skills and apply engineering principles to one's own work, as a member and/or leader in a team, to manage projects in a multidisciplinary environment.
- (xii) **Lifelong Learning:** An ability to recognize importance of, and pursue lifelong learning in the broader context of innovation and technological developments.

After successful completion of the Final Year Project, a student would achieve the 12 Program Learning Outcomes (PLOs) as defined by PEC in its accreditation manual of 2014 for their Final Year Project.

### 1.3 FINAL YEAR COURSE LEARNING OUTCOMES

Final Year Project CLOs along with its mapping to PLOs, quantification of PLOs via CLOs and description about assessment methods are shown in Table 1 and Table 2 respectively. To assess student’s performance in final year project, FYP rubrics are utilized that are given in Appendix H.

**Table 1: CLOs and their descriptions**

CLO	Description and domain
1	Explore and analyze constraints and requirements of software project (C4).
2	Investigate scientific literature related to the software project (C4).
3	Design and develop software project using engineering standards and latest tools and technologies (P5).
4	Plan and proceed work division using modular approach to complete the critical milestones of software project. (C5)
5	Improve project efficiency to ensure sustainability by utilizing the resources effectively via environment friendly practices (P4).
6	Evaluate software project deliverables to meet timeline and project constraints. (C6).
7	Excel in communication skills through presentations, written document (thesis) and/or publications/posters. (10:A4, 12:P5).

#### 1.3.1 MAPPING OF CLOs TO PLOs

The Table 2 (a) and (b) shows the mapping of CLOs to PLOs.

**Table 2 (a) : Mapping of CLOs to PLOs of Final Year Project**

Course	CLOs	PLOs												Learning Levels
		1	2	3	4	5	6	7	8	9	10	11	12	
FYP	1	✓	✓											C4
	2				✓									C4
	3			✓		✓								P5
	4						✓	✓	✓	✓				C5
	5							✓						P4
	6								✓		✓	✓		C6
	7										✓		✓	P5

**Table 2 (b): Quantification of PLOs via CLOs of Final Year Project**

Course	PLOs	CLO1	CLO2	CLO3	CLO4	CLO5	CLO6	CLO7
FYP	1	50%						
	2	50%						
	3			50%				
	4		100%					
	5			50%				
	6					25%		
	7					25%	100%	
	8					25%		33.3%
	9					25%		50%
	10							33.3%
	11							33.3%
	12							50%

Assessment Methods (Rubrics) of Final Year Project are defined in the appendix-II and marks distribution has been reported in Table 6.

## **1.4 OVERVIEW OF FINAL YEAR PROJECT**

A Final Year Project is a two-semester course in which students usually of 2-3 members select a project and are supervised by a faculty member. In this course, students choose a project subject and define the objectives of the project under the supervision of a faculty member, and prepare the project proposal including: defining the statement of the problem, defining system requirements, defining different candidate solutions for the problem of study, making feasibility study for different candidate solutions, defining the best candidate solution, defining time table schedule. Students present the final project report at the end of the semester to an evaluation a committee. The final year project is assigned to solve a complex engineering problem based on the knowledge and skills achieved while studying the Software engineering program. A comprehensive policy has been prepared to assign, track, evaluate and assess the final progress. The purpose of the policy is to provide a uniform system of guidelines to students and supervising faculty to realize their Bachelor of Engineering (BE) Final Year Projects (FYP). The aim of the FYP is to give each student the opportunity to experience the engineering design process in the context of a topic related to the Software Engineering curriculum while working in a less structured environment. Currently, the projects can be undertaken individually or in small groups. In the latter case the student

must still fulfill the requirements laid out by the departmental policy. The academic supervisor is a faculty member of Department of Software Engineering. CLOs for the final year project are defined as the part of the FYP policy. The progress of FYP is monitored in various steps throughout the project duration. The FYP is offered in seventh semester and continues till the eighth semester.

### 1.4.1 TIMELINE OF THE FYP ACTIVITIES

A tentative timeline of the FYP activities is shown in Figure 1.

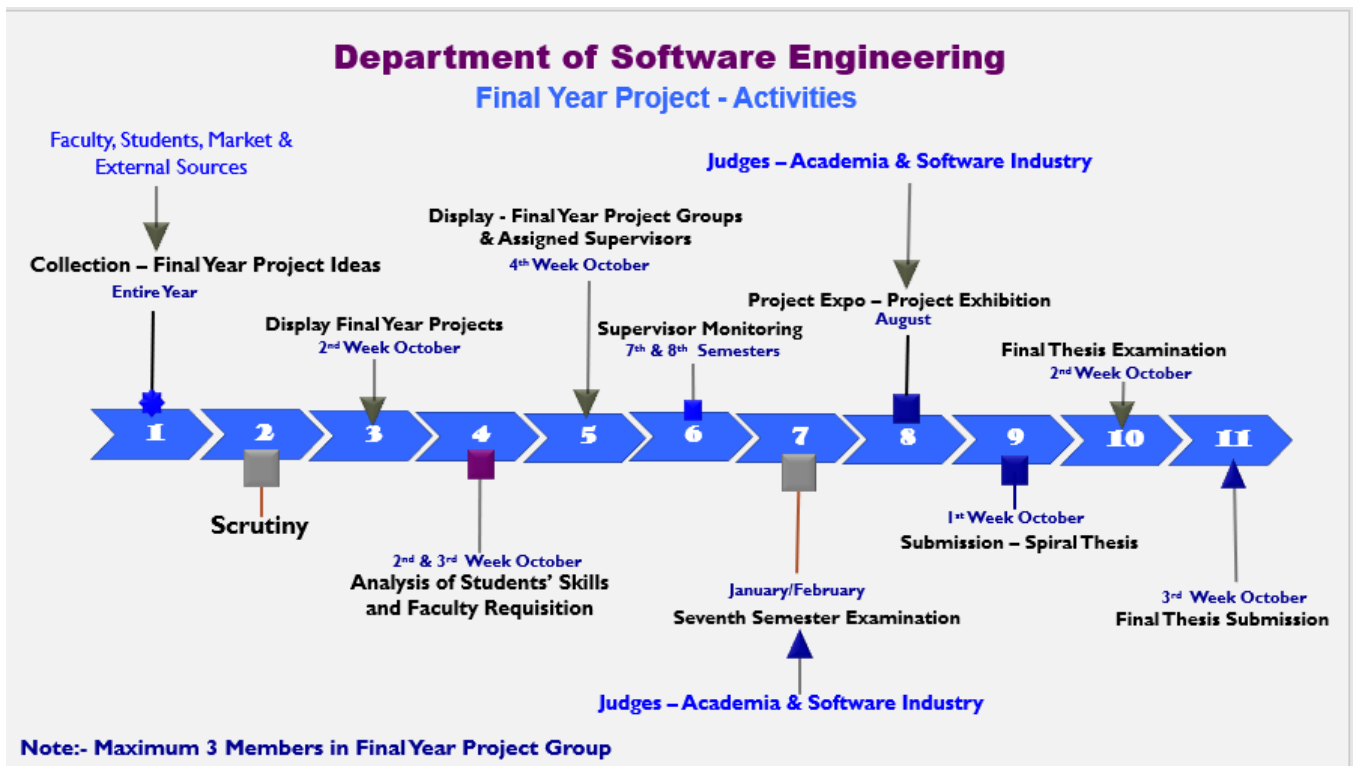


Figure 1. Tentative FYP activities timeline

First phase involves the collection of FYP ideas from the academia, software industry and other sources, which is then compiled and scrutinized by FYP Committee (list of committee members is given in Table 3 to form final ideas list. The list is displayed to the student groups and they are then interviewed to finalize an appropriate FYP idea for them along with the faculty supervisor. The supervisors guide the student groups during entire seventh and eighth semesters in their selected FYP completion and make sure the student groups work according to the FYP timeline. These FYPs ideas are displayed as prototypes at Initial defense in 7<sup>th</sup> semester exams and are evaluated by judges from both academia and software industry. The FYPs are finally exhibited by the student groups at the end of eighth semester in departmental event Software

Project Expo. Later, student groups are first required to submit a spiral thesis copy of their FYP for the final viva voce examination (8<sup>th</sup> Semester examination). The final viva voce examination is conducted and graded by an examination committee consisting of the chairman, supervisor, internal and an external subject expert in the final seminar. The internal and external examiners are invited from academia (other universities) and software industry (professional experts).

**Table: 3 List of FYP committee members:**

S.No:	Name	Role
1.	Dr. Mohsin Memon	Committee lead
2.	Dr. Isma Farah Siddiqui	Committee member
3.	Dr. Qasim Ali Arain	Committee member
4.	Ms. Amirita Dewani	Committee member
5.	Ms. Hira Noman	Committee member



## 1.5 FYP MILESTONES AND EVALUATION STAGES

The FYP milestones, deliverables, evaluation stages along with their timelines is given the Table 4.

**Table 4: Milestones & Marks Distribution**

<b>Initial Defense (7<sup>th</sup> Semester Exam)</b>	<b>50% (100 Marks)</b>
<ul style="list-style-type: none"> <li>• Comprehensive Knowledge about Project – 36%</li> <li>• Presentation skills – 16%</li> <li>• Design &amp; Methodology – 12%</li> <li>• Design Tools/Technologies – 12%</li> <li>• Individual/Team efforts – 12%</li> <li>• Professional Ethics – 12%</li> </ul>	Internal – 25% External – 25% Supervisor – 25% Chairman – 25%
<b>Final Defense</b>	<b>50% (100 Marks)</b>
<ul style="list-style-type: none"> <li>• Presentation Skills –20%</li> <li>• Sustainability – 28%</li> <li>• Design Tools/Technologies – 16%</li> <li>• Professional Ethics – 12%</li> <li>• Individual/Team efforts – 12%</li> <li>• Life-long learning (internship/CPD Points/Community work/Society Membership) – 12%</li> <li>•</li> </ul>	Internal – 25% External – 25% Supervisor – 25% Chairman – 25%
<b>Total</b>	<b>100%(200 Marks)</b>

### 1.5.1 INITIAL DEFENSE ( 7TH SEMESTER EXAM)

The students are given the option to either, choose a project from the project list displayed by the FYP Committee, or come up with their project idea. The project idea proposed by the students is thoroughly discussed in FYP Committee meeting and after approval by the committee, the students are allowed to work on their given project idea. Once the projects and their supervisors finalized and displayed, the students start working on their FYP projects. Each group remain in touch for the successful completion of the FYP with their respective supervisors (we encourage to have co-supervisor from industry, this time some of the projects are co-supervised by industrial professionals). At the end of 7<sup>th</sup> Semester, an examination is conducted for the evaluation of the FYP. The evaluators are from academia and software industry (Internal, External, Supervisor and Chairman).

The format of FYP proposal defense and evaluation forms and their rubric are given in Annex A. Also the template for FYP proposal is added in Appendix A.

### **1.5.2 POSTER (SOFTWARE EXPO)**

At the end of 8<sup>th</sup> semester, each group has to display their respective FYP in the departmental event – Software Project Expo. Each FYP group has to present their work to the larger group of audience (other departments and universities including software industry professionals). The format and evaluation forms & their rubric are given in Annex B.

### **1.5.3 FINAL DEFENSE**

Final Defense is the final activity for FYP students, which is evaluated by Advisor, Co-advisor and evaluation committee. Students also have to submit the Software Requirement Specifications (SRS) document at the time of mid defense. Template for SRS and evaluation rubrics are attached in Annex B. Later, once thesis submission is carried out for the final via voce. The evaluator panel remains same (Internal, External, Supervisor and Chairman details: Table 4). The format of FYP Final defense and evaluation forms and their rubric are given in Annex C. Also, the template for FYP final report submission is attached in Annex C.

Open house is arranged for final exhibition of final year projects. Most of the people from industry visits FYP stalls and judges are allocated to each FYP for evaluation.

## **1.6 GUIDELINES FOR PROJECT SUPERVISION**

Following rules should be taken under considerations during project supervision.

- a) Each group will work under the supervision of an assigned supervisor throughout the final year (term 7 & 8).
- b) Students are recommended to meet with their supervisor at least once a week or as suggested by supervisor. The students are expected to discuss their progress with their supervisors in these weekly meetings. The meetings are preferably scheduled on allocated “thesis day” but depending on students’ requirements and the supervisor’s availability, supervisors may also arrange additional meetings (physical/online) as requested.

- c) Supervisors might also arrange communication with student groups via email or other means for the purpose of advising project groups.
- d) It is the responsibility of the supervisor to inform his students with this handbook and all the included instructions and regulations.

### 1.6.1 TASKS EXPECTED FROM SUPERVISORS

During these meetings supervisors are expected to responsibilities given in Table 7:

**Table 7: List of responsibilities for supervisors during meetings**

✓ To provide FYP Outlines / Objectives	Orientation
✓ Discuss project expectations and the plan with the group	
✓ To share previous practice experience, research, skills and expertise	
✓ Assign /Recommend digital libraries and/or tools for gathering/collecting state of the art	Provide Knowledge
✓ To guide the students regarding online courses (preferably free) for the enhancement of technical knowledge	
✓ To clarify students queries effectively as needed	
✓ To make students aware of professional ethics and standards	
✓ To advise students on how to deal effectively as a team while working under pressure, remaining optimistic and persistent, and how to meet milestone deadlines	Assess
✓ To monitor the project progress on a weekly/fortnightly basis	
✓ To ensure students are completing outlined project deliverables	
✓ To grade students work (at individual/group level) at the end of each semester	

## 1.6.2 PROJECT DEVELOPMENT LIFE CYCLE:

The supervisors will guide the group through different steps in the software engineering life cycle and describe, discuss, assign, receive and review the corresponding outcomes/artifacts at the end of each step as described in Table 8.

**Table 8: FYP lifecycle and respective artifacts**

Inception	<ul style="list-style-type: none"><li>• Problem Definition &amp; Description</li></ul>
System Analysis	<ul style="list-style-type: none"><li>• Requirements Gathering</li></ul>
System Design	<ul style="list-style-type: none"><li>• System Modelling (Entity Relationship Diagram, Data Flow Diagram, Class Diagram etc.)</li><li>• System Design Specification (SDS)</li></ul>
System Implementation	<ul style="list-style-type: none"><li>• Coding/ Working System</li></ul>
System Testing	<ul style="list-style-type: none"><li>• Test Cases using manual and automated tools</li><li>• Documentation of Test Results</li></ul>
System Deployment	<ul style="list-style-type: none"><li>• Hosting of Web-Based Application on server</li><li>• Deployment of Mobile app for general/targeted group</li></ul>
User Acceptance	<ul style="list-style-type: none"><li>• User Testing</li></ul>

During the Project Proposal, students undertake the initial phases of project planning, selection, analysis and designing phases. In the Project Implementation, students proceed with the implementation phase of their proposed project. As part of SDLC, the supervisors should guide the students to follow, but not limited to, the following best-practices as shown in Table 9:

**Table 9: Best practices for students to follow**

a) Having a life cycle or system development methodology
b) Ensure proper research and background knowledge is acquainted
c) Feasibility study is conducted on the proposed project
d) Scope of the project is precise and crystal clear
e) Generating and comparing alternative designs to determine best match for the requirements
f) Roles & responsibilities of individual student working within the group is clear and accepted
g) Able to apply project resources as per the approved project plan
h) Track and report any issues and risks in completing assigned tasks
i) Both logical and physical design aspects are analyzed
j) Proper programming standards are maintained during the development of the project
k) Auto or Manual Test Cases are implemented and executed

l) Source control with versioning tools are used for developing as a team
m) Documenting required deliverables using industry standards
n) Participating in Seminars, Events, Publications and Workshops relevant to the project

## 1.7 GROUP LEADERSHIP

Every final year project group is assigned with a Group Leader (GL) who is essentially a cross- functional key player working within the project group. It is extremely important to get the right student within each group fit for the role of team leader which is crucial for the success of any project. GL is preferably the student with highest CGPA among other group members. Team leader should work very closely with the supervisor with the following, but not limited to, the primary tasks as given in Table 10:

**Table 10: Primary tasks of the team leader**

a)	Provide input on the performance of team members
b)	Resolve any conflicts within group members and maintain healthy group dynamics
c)	Inform supervisor of any task delays and meeting hours change requests from students
d)	Ensure rest of the group understands their roles and responsibilities on the assigned tasks;
e)	Coordinate with internal or external project stakeholders on behalf of the team
f)	Provide weekly status report – completed and signed by each team member as per the Schedule

**Note:** During the course of the project, if the supervisor finds team leader is not performing as per the above expectations, the supervisors can request for the replacement of team leader with an alternative group member fit for this role.

## 1.8 STUDENTS RESPONSIBILITY

During the Final Year Project, students are responsible for the following as provided in Table 11.

**Table 11: Responsibilities of students during FYP**

a.	Agree with their assigned supervisors on the topic
b.	Perform weekly tasks, assigned by the supervisor (or distributed by the team leader)
c.	Discuss problems and seek advice from the supervisor in order to accomplish the assign tasks.
d.	Provide supervisor weekly status reports and get his/her feedback
e.	Apply recommendations to refine the previous task
f.	Finalize the project proposal and implementation, incorporating all the feedbacks and comments provided by the supervisor and evaluators.
g.	Conduct presentation at the end of each semester and defend project to the evaluation panel

## 1.9 LATE SUBMISSIONS

It is the responsibility of each group to ensure they complete the milestones of each semester and submit deliverables by the cutoff submission date. No project will be accepted after the cutoff date and necessary actions will be taken as per the supervisor and the evaluation committee decision policy.

## 1.10 PLAGIARISM

Each project must be the original work of student groups. At the end of each semester, students will be required to present their project proposal and implementation outcomes as per the provided deliverables guidelines and the original work undertaken throughout each semester.

In the FYP thesis, for instance, if students have taken ideas or referencing other work as part of the proposed project, then, it must be cited and reference should be clearly specified. Same is the case while implementing the proposed solution. For instance, if students are developing project using 3<sup>rd</sup> party tools and libraries, it must be referenced and relevant comments and notes must be highlighted and will not be regarded as part of the original work of student groups. Hence, it is extremely important to note that it is the responsibility of students to ensure they are not plagiarizing knowingly or unknowingly.

In order to prevent plagiarism related issues, students are encouraged to get familiar with plagiarism specified in [1] and general referencing guidelines specified in [2].

In order to prevent plagiarism related issues during implementation, students are strongly encouraged to get familiar with software plagiarism specified in [3].



Students can get the plagiarism report via Turnitin account [4]. The report must be verified and signed by the supervisor. The maximum plagiarism from different sources should not exceed 20%.

**If students are found plagiarizing either in project proposal report or in the project implementation solution/code, immediate strict action will be taken as per the university policy.**



# ANNEX A

## FYP POSTER SAMPLE

FYP BATCH 16		
	<b>Title</b>	
GROUP MEMBERS SUPERVISOR		
<b>Abstract</b>	<b>Introduction</b>	<b>Problem statement</b>
		<b>Conclusion</b>
<b>Methodology</b>	<b>Results</b>	<b>Tools and technologies</b>
		<b>Beneficiaries</b>

## ANNEX B FYP INITIAL PRESENTATION

	<b>INITIAL SEMINAR - PRESENTATION TEMPLATE</b>
<h1>Project Title</h1>	
<p>1</p>	
<b>Group Members</b>	
<ol style="list-style-type: none"><li>1.</li><li>2.</li><li>3.</li><li>4.</li></ol>	
<b>Name of Supervisor(s):</b>	
<small>DEPARTMENT OF SOFTWARE ENGINEERING, MUTM</small>	

## Presentation Outline

2

1. Presentation Outline
2. Background and Motivation
3. Relevant Work / Literature Review
4. Aim and Objectives
5. Methodology
6. Expected Budget (for Hardware projects only)
7. Timeline
8. References

## **ANNEX C**

### **ARRANGEMENT OF THE THESIS**

Each thesis must be arranged in the following order. The detail about each section is given on following pages.

- Title Page
- Dedication Page
- Certification of Approval
- Acknowledgement
- Table of Contents
- List of Abbreviations
- List of Figures
- List of Photographs
- List of Tables
- Abstract
- Chapter 1 – Introduction
- Chapter 2 – Literature Review
- Chapter 3 – Research Methodology / Experimental Work
- Chapter x - .....
- Chapter x – Conclusions and Recommendations
- References
- Appendices

#### **1. ARRANGEMENT OF THE THESIS**

The thesis should be divided into three sections:

Sections 1 Preliminary pages must be placed before the text. These pages contain title page, dedication page, certification of approval of thesis by examination committee, Author's declaration, plagiarism undertaking by the scholar, copyright page, acknowledgement page, table of contents, list of abbreviations, list of figures, list of notations, list of photographs, list of tables and abstract.

Sections 2 Main body (text) of the thesis consisting of various chapters, sections and sub-sections, including the chapter of conclusions and recommendations and References.

Sections 3 Appendices must be placed after the text.

The details of the sections along with formatting is discussed in later sections.

## **2. SIZE AND QUALITY OF PAPER**

The thesis should be prepared on standard A4 size (210 mm x 297 mm) good quality white paper (at least 80 gm). The same paper should also be used for Figures, Tables and Charts etc. and for mounting Photographs (if any).

## **3. SPELLINGS**

Either the American or British English spellings should be used throughout the thesis.

## **4. TYPING AND PRINTING**

- i. The entire thesis must be computer-typed and printed through laser printer with black ink on plain paper without any borderlines, logos, insignia, monograms etc.
- ii. The main text of the thesis must be typed 1.5 spaced with font Times New Roman, size 12, unless specified otherwise, or any other font and / or size as approved.
- iii. Each chapter must start on a new page and be typed continuously with sections and sub-sections on successive pages.
- iv. The chapter number and heading should be typed centered on the page in bold capitals and underlined with font size 14. The chapter heading should be placed below the chapter number. The chapter number should be in Arabic numerals, e.g.,

### CHAPTER 2

#### LITERATURE REVIEW AND RESEARCH FRAMEWORK

- v. The section number and heading must be typed from the left margin in capitals bold letters without underlining. The section number must consist of the chapter number followed by a number, both in Arabic numerals, e.g.,

#### **2.1 RESEARCH GAP**

- vi. The sub-section numbers and headings must be typed from the left margin in bold lower-case characters with the first character of the first word in capital without underlining. The sub-section must consist of the chapter number followed by section number and one additional number representing the subsection, all in Arabic numerals, e.g.,

**2.1.1 Research Objectives**

- vii. Any further sub-section numbering, if needed, must be done with additional Arabic numerals without bold letters, e.g.,

2.1.1.1 Research Sub-objectives

## 5. MARGINS

Margins of 1½ inch must be left at the top and left side, and 1 inch on the right side and bottom of the paper.

## 6. TABLES

- i. Each table must be typed following the place where it is referred first, preferably on the same page, or if it cannot be accommodated in the remaining space on the same page then on the following page, with single or one and a half spacing as is found convenient to accommodate the table on one page within the specified margins.
- ii. A long table which cannot be accommodated on one page, even with single line spacing and/or reduced to an easily legible size, may be continued on the next page under the same table number with proper indication at the bottom of the page, e.g., "continued on the next page".
- iii. The heading of the table must be in bold lower case letters with the first character of the first word in capital without underlining. The number and heading of the table should be typed above the table itself.
- iv. All the tables belonging to each chapter must be numbered in the same way as the sections of the chapter, the first number indicating the chapter number and the second the table number in sequence, both in Arabic numerals, e.g.,

**Table 4.1: Comparison of theoretical and experimental results**

- v. If any table is referred on a page other than that where it is placed, it should be referred with its number and the page where it is placed, e.g., Table 4.1 on p. 36.

## 7. FIGURES

- i. Each figure must be drawn and placed within the specified margins following the place where it is referred first, preferably on the same page, or if it cannot be accommodated in the remaining space on the same page then on the following page.
- ii. The number and caption of each figure should be typed under it with bold letters in the same way as the headings of tables described above, e.g.,

**Fig 4.1: Scatter Plot**

- iii. If any figure is referred on a page other than that where it is placed, it should be referred with its number and the page where it is placed, e.g., Fig. 4.1 on p.43.

## **8. PHOTOGRAPHS**

- i. Each photograph, colored or black and white, must be placed within the specified margins following the place where it is referred first, preferably on the same page, or if it cannot be accommodated in the remaining space on the same page then on the following page.
- ii. The number and caption of each photograph should be typed under it with bold letters in the same way as for figures, e.g.,

**Photograph 4.1: Technology Adoption Model**

- iii. If any photograph is referred on a page other than that where it is placed, it should be referred with its number and the page where it is placed, e.g. Photograph 4.1 on p.54.

## **9. LARGE SIZE DRAWINGS, CHARTS, FIGURES, AND TABLES**

Any drawing, chart, figure or table, which cannot be accommodated with clarity on the normal size of the thesis page, even with easily legible reduced size, may be prepared on a larger size paper / sheet, which should be folded and enclosed in a special pocket attached permanently inside of the bound back of the thesis.

## **10. EQUATIONS**

All equations belonging to a chapter in the text should be numbered in the same way as the figures and tables. Each equation should start on a separate line with a larger than the normal spacing between the equation and the text above and below it, e.g.,

$$Ax+By=C \qquad (4.1)$$

The equation should be referred to in the text as Eq. (4.1)

## **11. PAGINATION OF TEXT**

The pages in the text should be numbered in Arabic numerals, consecutively, starting from the page where the first chapter begins. The starting page of each chapter should have the page number printed centrally at bottom of the page. All the other pages should have page numbers typed at the top right corner.

## **12. PRELIMINARY PAGES**

The following pages are to be placed in the order given below before the text of the thesis. These pages should be numbered in lower Roman numerals, consecutively, starting (i) from the title page and the numbers should be placed centrally at bottom of each page.

### **i. Title Page**

The title page should present the MUET logo, thesis title (Times New Roman - 20), students name (Times New Roman - 16), the statement "Thesis submitted to MUET for the degree of" (Times New Roman - 14), field of study (Times New Roman - 14), department / institute (Times New Roman - 14), faculty (Times New Roman - 14) and the month and year of approval (Times New Roman - 14). A specimen of the title page is given in Appendix 1.

### **ii. Dedication Page**

If a candidate desires to dedicate his / her thesis to any person or organization, it should be so stated on this page with heading (Times New Roman - 18) and text (Times New Roman - 12). A specimen of this page is given in Appendix 2.

### **iii. Certificate of Approval of thesis by examination committee**

A certificate signed by the thesis internal and external examiners, including the candidate and his/her Supervisor and co-supervisor, Director of the concerned Institute and Dean of-the concerned Faculty, indicating the approval of the thesis, should be put on this page with heading (Times New Roman - 18) and text (Times New Roman - 12). A specimen of the certificate page is given in Appendix 3.



**iv. Author's Declaration**

A brief declaration with a candidate name on it stating that the PhD thesis is his/her own work and not submitted anywhere else should be given on this page with heading (Times New Roman - 18) and text (Times New Roman - 12). A specimen of the certificate page is given in Appendix 4.

**v. Plagiarism undertaking by the Scholar**

An undertaking by student in lines of zero tolerance policy of HEC of plagiarism signed by scholar should be given on this page with heading (Times New Roman - 18) and text (Times New Roman - 12). A specimen of the certificate page is given in Appendix 5.

**vi. Copyright Page**

According to the MUET IP Policy, university possesses 100% copyright of the thesis conducted by PhD scholars. A copyright must be mentioned given on this page (Times New Roman – 28). A specimen of the page is given in Appendix 6.

**vii. Acknowledgement**

A brief acknowledgement, in just one page, only to those persons and organizations who have assisted the candidate in his/her thesis work, or provided relevant data/ information/laboratory or research facility and tools etc. should be given on this page with heading (Times New Roman - 18) and text (Times New Roman - 12). A specimen of the page is given in Appendix 7.

**viii. Table of Contents**

It should contain the numbers and headings of all the preliminary pages following the Table of Contents, chapters, sections and subsections of the text, including references and appendices, described consecutively, and should indicate the page where the item starts. It should be typed with single line spacing, and with the same font and size of both the capital and lower case characters / letters as followed in the text of the thesis. A specimen of the page is given in Appendix 8.

**ix. List of Abbreviations**

This list should contain all the abbreviations used in the thesis and should be typed with single line spacing. The abbreviations must be listed in the alphabetical order with heading (Times New Roman - 18) and text (Times New Roman - 12). A specimen of the page is given in Appendix 9.

**x. List of Figures**

The number and caption of each figure, including the page number where it is located in the text, should be provided, consecutively and chapter-wise, in this list and should be typed with single line spacing.

**xi. List of Notations**

All standard notations in English or Greek characters appearing frequently in the text should be described in the list of notations in alphabetical order with the notations in capitals preceding those in lower case characters. All other notations appearing only once in the text need not be given in this list but should be defined at the place where they appear in the text. This list should be typed with single line spacing. A specimen of the page is given in Appendix 10.

**xii. List of Photographs**

The number and caption of each photograph, including the page number where it is located in the text, should be provided, consecutively and chapter-wise, in this list and should be typed with single line spacing.

**xiii. List of Tables**

The number and heading of each table, including the page number where it appears in the text, should be provided, consecutively and chapter-wise, in this list and should be typed with single line spacing.

**xiv. Abstract**

A brief summary of maximum of 350 words of the whole thesis should be given on this page with heading (Times New Roman - 18) and text (Times New Roman - 12). A detail about this page is given in Appendix 11.

**xv. Appendices**

The number and title of each appendix including the page number where it is located should be provided, consecutively, in this list and should be typed with single line spacing.

### **13. REFERENCES**

In order to avoid plagiarism and enable a reader to trace the source of knowledge, all the references quoted in the entire thesis must be placed at the end of the text in the Harvard style alphabetically. There are two parts to referencing using Harvard style: the reference list and citing the references in the text. The reference list appears at the end of the thesis document and citation is within the text.

The citation mentions the author's surname and year of publication. The citation style varies depending upon the number of authors.

**For a single author** – Qureshi (2018)

**For two authors** – Bhutto and Qureshi (2018)

**For three authors** – Bhutto, Shah and Qureshi (2018)

**For four or more authors** – Balochet *al.* (2018)

The reference list must have surname followed by initials of the authors. The year of publication, in round brackets, should follow the names. In the case of more than one publication of the same author(s) in one year, the year of publication should be followed by the letter 'a', 'b' and so on. The specimen of describing various types of publications from various types of sources are given in Appendix12.

### **14. BINDING OF THE THESIS**

The thesis should be hard bound in dark blue color, as per specimen available with the Director, Post-Graduate Studies / Director of the concerned Institute / Chairman of the concerned Department. The title of the thesis, author's name, title of the degree, year of award of the degree and Mehran University of Engineering and Technology should be printed in gold letters on the front of the cover. The back of the cover should not have any thing printed on it. The author's name, title of the degree and year of award should be printed in gold letters on the bound edge. Appendix 13 shows the specimen of these writings.

# TITLE OF THESIS



By:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Supervised by:  
(Name of the Supervisor)

DEPARTMENT OF SOFTWARE ENGINEERING  
MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY, JAMSHORO

Submitted in partial fulfillment of the requirement for the degree  
of Bachelor in Software Engineering.

2019

## **Certificate of Approval**

This is to certify that the work presented in this thesis presented on \_\_\_\_\_ is entirely designed, developed and written by the following students themselves.

Names

\_\_\_\_\_  
\_\_\_\_\_

Roll No.

\_\_\_\_\_  
\_\_\_\_\_

.  
.  
.

\_\_\_\_\_  
Supervisor

\_\_\_\_\_  
Chairman

Dated: \_\_\_\_\_

**ANNEX D**  
**THESIS TEMPLATE IN LATEX**

- Link for Latex Template is given below: For further assistance Contact  
Mr. Zubair Sangi

Link: <https://sw.muet.edu.pk/downloads.php>

**FYP Proposal Defense Evaluation Form and Rubrics**

<b>Criteria</b>	<b>1 - Unacceptable</b>	<b>2 – Acceptable</b>	<b>3 - Adequate</b>	<b>4 - Proficient</b>	<b>PLOs</b>
<b>R1</b> Project Knowledge	Student has no knowledge of problem and solution.	Partial understanding of the overall project problem statement, goals and complexity with an approximate plan and minor design deliverables to proceed further.	Student has competent knowledge and can reply to the queries but without justification.	Full understanding of the overall project problem statement, goals and complexity with a clear workout plan, design deliverables and feasibility report to proceed further.	4 (CLO-4)
<b>R2</b> Organization and Content of Presentation	Student is clueless about the content of presentation	Student has not employed graphs, figures, charts to explain salient points	Student has clearly organized presentation content and used few figures and graphs	All key points covered in presentation and student has presented with clear and logical flow.	10 (CLO-6, 7)
<b>R3</b> Societal Impact	Student is clueless about societal impact	Student knows but is unable to justify societal impact of project	Student gives reasonable justification of societal impact of project	Student provides sufficient details about how this project will impact the Society.	6 (CLO-4)
<b>R4</b> Literature Review	Literature review is absent or in vague form	Literature review contains reasonable description of project background but more research references are required	The review gives good background knowledge of the project but it is not written in scientific writing standard	Literature review is excellently written according to the scientific writing standards and covers maximum of research material	2 (CLO-1)
<b>R5</b> Methodology and design	The approach that will be taken to solve the problem is not discussed	The methods, design, algorithm and other aspects are discussed but not convincingly. Much is left to reader's imagination	The methods, design, algorithm and other aspects are discussed sufficiently.	The methods, design, algorithms and other aspects are sufficiently discussed with details and figures. Work division between group members is defined	3 (CLO-3)
<b>R6</b> Tools and Technologies	Student has not used existing engineering tools	Student has marginally exploited the capabilities of the tools used to	Student has adequately used modern tools to complete project but lacks other alternatives that	Student has employed tools to their capacity and is well informed of modern tool usage.	5 (CLO-3)

		create project	could have been used		
<b>R7</b> Green Computing	Student is clueless about the environmental impact of the project	Student is unable to justify the environmental impact of the project and its sustainability goals	Student justifies efficient resource utilization and its impact on environment	Student provides clear environmental and sustainability goals and how they are achieved.	7 (CLO-4,5)
<b>R8</b> Ethics	The project contents are plagiarized	Student has cited others work but it is not related to the project	Student has cited existing work but it is not consistent.	Properly acknowledged and ethically used existing work/material	8 (CLO-4,6)
<b>R9</b> Work Division & Management	Working division among group members is not shown	Work division is shown but more clarity is needed	Work division is clearly shown	Work division is shown and each member is equally given responsibilities	9, 11 (CLO-4,6)
<b>R10</b> Lifelong Learning	Student has poor preparation to engage in independent &lifelong learning	Student has poorly engaging in independent learning	Student is satisfactorily engaged in life-long learning in the broader context of technological change/managerial/community activities.	Student has shown keen interest in independently engaging in lifelong learning.	12 (CLO-7)



**Marks Distribution with respect to FYP Rubrics for each Evaluator**

**7<sup>th</sup> Semester (100 Marks)**

Chairman	External	Internal	Supervisor	Total
25	25	25	25	100

Rubrics	Marks	Unacceptable	Acceptable	Adequate	Proficient
R1 Project Knowledge	5	0	3	4	5
R2 Organization and Content of Presentation	4	0	2	3	4
R4 Literature Review	4	0	2	3	4
R5 Methodology and design	3	0	1	2	3
R6 Tools and Technologies	3	0	1	2	3
R8 Ethics	3	0	1	2	3
R9 Individual/Team efforts	3	0	1	2	3
<b>Total</b>	25				

**8<sup>th</sup> Semester (100 Marks)**

Chairman	External	Internal	Supervisor	Total
25	25	25	25	100

Rubrics	Marks	Unacceptable	Acceptable	Adequate	Proficient
R2 Organization and Content of Presentation	5	0	3	4	5
R3 Societal Impact	4	0	2	3	4
R6 Tools and Technologies	4	0	2	3	4
R7 Green Computing	3	0	1	2	3
R8 Ethics	3	0	1	2	3
R9 Individual/Team efforts	3	0	1	2	3
R10 life-long learning	3	0	1	2	3
<b>Total</b>	25				

## FYP 7<sup>TH</sup> SEMESTER DEFENCE EVALUATION FORM

Rubrics	Marks	Unacceptable	Acceptable	Adequate	Proficient
R1 Project Knowledge	5	0	3	4	5
R2 Organization and Content of Presentation	4	0	2	3	4
R4 Literature Review	4	0	2	3	4
R5 Methodology and design	3	0	1	2	3
R6 Tools and Technologies	3	0	1	2	3
R8 Ethics	3	0	1	2	3
R9 Individual/Team efforts	3	0	1	2	3

Project Title \_\_\_\_\_

Student Name \_\_\_\_\_ Roll Number \_\_\_\_\_

Rubrics	PLO	Evaluation				Marks	
		Unacceptable	Acceptable	Adequate	Proficient	Total	Obtained
<b>R1 Project Knowledge</b>	PLO 4: Investigation (CLO-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	
<b>R2 Organization and Content of Presentation</b>	PLO 10: Communication (CLO-6,7)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	
<b>R4 Literature Review</b>	PLO 2: Problem Analysis (CLO-1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	
<b>R5 Methodology and design</b>	PLO 3: Design/ Development of Solutions (CLO-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	
<b>R6 Tools and Technologies</b>	PLO 5: Modern Tool Usage (CLO-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	
<b>R8 Ethics</b>	PLO 8: Ethics (CLO-4,6)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	
<b>R9 Individual/Team efforts</b>	PLO 9: Individual and Team Work PLO 11: Project Management (CLO-4,6)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	
<b>Total Marks</b>						<b>25</b>	

Evaluator Name: \_\_\_\_\_ Signature with Date: \_\_\_\_\_

Comments \_\_\_\_\_

## FYP 8<sup>TH</sup> SEMESTER DEFENCE EVALUATION FORM

Rubrics	Marks	Unacceptable	Acceptable	Adequate	Proficient
R2 Organization and Content of Presentation	5	0	3	4	5
R3 Societal Impact	4	0	2	3	4
R6 Tools and Technologies	4	0	2	3	4
R7 Green Computing	3	0	1	2	3
R8 Ethics	3	0	1	2	3
R9 Individual/Team efforts	3	0	1	2	3
R10 life-long learning	3	0	1	2	3

Project Title \_\_\_\_\_

Student Name \_\_\_\_\_ Roll Number \_\_\_\_\_

Rubrics	PLO	Evaluation				Marks	
		Unacceptable	Acceptable	Adequate	Proficient	Total	Obtained
<b>R2 Organization and Content of Presentation</b>	PLO 10: Communication (CLO-6,7)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5	
<b>R3 Societal Impact</b>	PLO 6: The Engineer and Society (CLO-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	
<b>R6 Tools and Technologies</b>	PLO 3: Modern Tool Usage (CLO-3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4	
<b>R7 Green Computing</b>	PLO 7: Environment and Sustainability (CLO-4,5)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	
<b>R8 Ethics</b>	PLO 8: Ethics (CLO-4,6)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	
<b>R9 Individual/Team efforts</b>	PLO 9: Individual and Team Work (CLO-4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	
<b>R10 life-long learning (internship/CPD Points/Community work/Society Membership)</b>	PLO 12: Lifelong Learning (CLO-7)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3	
<b>Total Marks</b>						<b>25</b>	

Evaluator Name: \_\_\_\_\_ Signature with Date: \_\_\_\_\_

Comments

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## References

- [1] PLAGIARISM.ORG, Available Online: [h ttp://plagiarism.org](http://plagiarism.org)
- [2] London South Bank University, “How to do your referencing: Numeric Style”, Available Online: [h ttp://www.lsbu.ac.uk/library/helpsheets/hs28.pdf](http://www.lsbu.ac.uk/library/helpsheets/hs28.pdf)
- [3] Neal R. Wagner, University of Texas, Plagiarism by Student Programmers, Available Online: [h ttp://www.cs.utsa.edu/~wagner/pubs/plagiarism0.html](http://www.cs.utsa.edu/~wagner/pubs/plagiarism0.html)
- [4] <https://www.turnitin.com/>