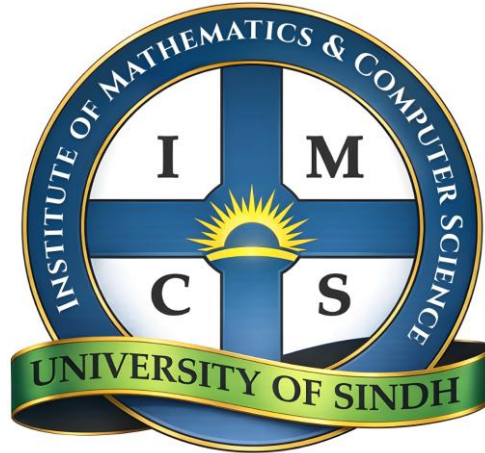


INSTITUTE OF MATHEMATICS & COMPUTER SCIENCE

UNIVERSITY OF SINDH, JAMSHORO



FINAL YEAR PROJECT (FYP)

STUDENT GUIDELINES BOOKLET

BS Computer Science Program

Academic Guidance Document for Final Year Students

Prepared for BS Computer Science Students of IMCS

University of Sindh, Jamshoro

Based on HEC Curriculum Booklet – Computer Science 2025 and Annex-B: FYP Guidelines – Computing Programs

Document Control

Item	Details
Document Title	Final Year Project (FYP) Student Guidelines Booklet
Program	BS Computer Science
Institute	Institute of Mathematics & Computer Science (IMCS)
University	University of Sindh, Jamshoro
Purpose	Student guidance for proposal, supervision, implementation, evaluation, documentation and final defense of FYP.
Source Basis	HEC Curriculum Booklet – Computer Science 2025; Annex-B: Final Year Project Guidelines – Computing Programs.
Document Status	Student guidance booklet; may be adapted subject to departmental and university approval.

Message for Students

Dear Students,

The Final Year Project is one of the most important academic activities of your BS Computer Science degree. It is not merely a formality or a routine assignment. It is your opportunity to demonstrate what you have learned during your degree, how well you can solve real-world problems, and how effectively you can work as a computing professional.

Through the FYP, you are expected to identify a meaningful problem, analyze its requirements, design a proper solution, develop a working system or model, test it, document it, and present it before evaluators. Your project should reflect creativity, technical skill, teamwork, discipline, ethical responsibility, and professional maturity.

Students are advised to take the FYP seriously from the very first day. A good project requires planning, regular meetings with the supervisor, continuous development, documentation, testing, and honest effort.

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1. Introduction to Final Year Project

The Final Year Project, also called the Capstone Project, is a compulsory academic requirement for BS Computer Science students. It is designed to test the student's ability to apply computing knowledge to a practical, research-based, industrial, or social problem.

The FYP may result in a software application, mobile application, web platform, artificial intelligence model, data science solution, cybersecurity tool, IoT system, research-based prototype, or any other computing-related solution approved by the department.

According to the HEC framework for Computing Programs, the Final Year Project is mandatory, carries a minimum of six credit hours, and must be completed as prescribed in the approved scheme of studies. The FYP should be supervised by an approved faculty member and evaluated through proposal submission, progress reviews, final presentation/demonstration, report submission and, where required, external evaluation.

A successful FYP should show that students can:

1. Understand and define a real problem.
2. Study existing solutions and identify gaps.
3. Propose a technically sound solution.
4. Design the system, model, or architecture.
5. Implement the solution using appropriate tools.
6. Test and evaluate the final output.
7. Prepare proper documentation.
8. Present and defend the work professionally.

2. Objectives of the FYP

The main objectives of the Final Year Project are to develop professional, technical, analytical, ethical and communication capabilities among final year students. In particular, the FYP aims:

1. To develop problem-solving ability among students.
2. To promote practical application of computer science concepts.
3. To encourage innovation, research, and creativity.
4. To develop teamwork and project management skills.
5. To improve technical writing and presentation skills.
6. To prepare students for industry, entrepreneurship, and higher studies.
7. To expose students to real-world software development, data analysis, artificial intelligence, cybersecurity, networking and emerging technologies.
8. To develop ethical, professional and responsible computing graduates.

3. Credit Hours and Duration

The Final Year Project carries six credit hours. Normally, it is completed over two consecutive semesters as FYP-I and FYP-II.

Component	Semester	Credit Hours	Main Focus
FYP-I	7th Semester	3 Credit Hours	Proposal, research, requirements, design and initial prototype
FYP-II	8th Semester	3 Credit Hours	Full development, testing, report, presentation and final demonstration

In special cases, where the approved scheme allows, the FYP may be completed during the final semester. However, the workload, supervision, evaluation stages and deliverables must still be equivalent to six credit hours.

4. Eligibility to Start the FYP

A student may start the FYP after reaching the final year of the BS Computer Science program and fulfilling the departmental requirements. Students are expected to have sufficient academic and technical background before selecting a project area.

Students should preferably have sound understanding of:

- Programming Fundamentals
- Object-Oriented Programming
- Data Structures
- Database Systems
- Software Engineering
- Web, mobile or application development
- Artificial Intelligence or Data Science, where relevant
- Computer Networks or Cybersecurity, where relevant
- Research methods and technical writing

Students are advised not to select a project in an area where they do not have the required technical background, unless they are willing to undertake serious self-learning under supervisor guidance.

5. Project Categories

Students may select a project from any approved computing area. The following categories are recommended for BS Computer Science students of IMCS.

5.1 Software Development Projects

These include web applications, mobile applications, desktop systems, APIs, automation tools, enterprise applications and management systems.

Examples include:

- Student academic record system
- Online complaint management system
- Hospital appointment system
- Inventory and billing system
- Learning management platform
- Society maintenance and billing system

Such projects must go beyond simple CRUD operations. They should include proper authentication, role-based access, reporting, dashboards, validation, testing and meaningful functionality.

5.2 Artificial Intelligence and Machine Learning Projects

These projects involve intelligent models, predictions, classification, recommendations, image processing, natural language processing or decision-support systems.

Examples include:

- Disease prediction system
- Fake news detection
- Student performance prediction
- Crop disease detection
- Urdu/Sindhi text classification
- AI-based chatbot for student services

AI projects must include dataset details, preprocessing, model training, evaluation metrics and comparison of results.

5.3 Data Science and Analytics Projects

These projects involve collection, cleaning, analysis, visualization and interpretation of data.

Examples include:

- Dashboard for university admission trends
- Analysis of academic performance
- Traffic accident data analysis
- Weather or flood data visualization
- Public health data analytics
- Financial or stock market prediction

Data science projects must clearly explain the dataset, cleaning process, analytical method, visualization strategy and conclusions.

5.4 Cybersecurity Projects

These projects focus on security, privacy, threat detection, secure communication or cyber awareness.

Examples include:

- Phishing website detection
- Password strength analysis tool
- Secure login and authentication system
- Network intrusion detection
- Cybercrime awareness platform
- Malware behavior analysis in a controlled lab environment

Cybersecurity projects must remain ethical and legal. Unauthorized hacking, scanning, credential stealing or harmful activity is strictly prohibited.

5.5 IoT, Embedded Systems and Robotics Projects

These projects involve sensors, devices, automation, robotics or smart systems.

Examples include:

- Smart attendance using IoT
- Air quality monitoring system
- Smart irrigation system
- Fire detection and alert system
- Smart parking system
- Home automation system

Students must consider hardware availability, cost, maintenance, safety and demonstration feasibility before selecting such projects.

5.6 Cloud, DevOps and Networking Projects

These projects involve deployment, cloud services, distributed systems, networking, monitoring or automation.

Examples include:

- Cloud-based file management system
- Containerized application deployment
- Network monitoring dashboard
- CI/CD pipeline for web application
- Serverless application prototype
- Secure VPN or network simulation

These projects should demonstrate deployment, scalability, monitoring, performance, security or automation aspects.

5.7 Research-Oriented Projects

These projects may involve algorithm comparison, performance analysis, simulation, model evaluation or applied computing research.

Examples include:

- Comparison of machine learning algorithms for classification
- Performance analysis of database indexing methods
- Evaluation of sorting algorithms on large datasets
- Comparative study of cloud deployment models
- Optimization of neural network performance

Research-oriented projects must have a clear question, methodology, experiment, evaluation metric and documented results.

6. Team Formation

Students may work individually or in teams according to departmental policy. Every team must have a reasonable workload matching six credit hours, and every student must have a clearly defined role.

Project Type	Recommended Team Size
Small research/model-based project	1–2 students
Normal software/system project	2–3 students
Large multidisciplinary project	3 students
Special large project	More than 3 only with prior approval

No student should be added to a project only for formality. Every member must contribute and must be able to explain his or her part during evaluation.

7. Role of Team Leader and Team Members

7.1 Team Leader

The team leader shall act as the coordinator between the team, supervisor and FYP Committee. The team leader shall:

1. Coordinate with the supervisor.
2. Submit forms and documents on time.
3. Maintain communication with the FYP Committee.
4. Keep a record of meetings and progress.
5. Ensure that all members are informed about deadlines.
6. Submit progress updates when required.

The team leader is not responsible for doing the work of inactive members. Individual contribution will still be assessed separately.

7.2 Team Members

Each team member shall:

1. Perform assigned tasks honestly.
2. Attend supervisor meetings.
3. Participate in development and documentation.
4. Understand the complete project, not only one small part.
5. Maintain evidence of contribution.

6. Appear in presentations, demonstrations and viva voce.

Individual marks may vary according to contribution and performance.

8. Supervisor and Co-Supervisor

Each FYP must be supervised by an approved faculty member of the department. The supervisor guides the students throughout the project and monitors both technical progress and academic quality.

The supervisor shall:

1. Guide topic selection and proposal development.
2. Approve the project scope.
3. Monitor progress regularly.
4. Review documentation and technical work.
5. Advise students about methodology, tools and standards.
6. Recommend the project for evaluation when satisfactory.

An industry co-supervisor may be added where the project is industry-based or requires practical domain expertise. Industry co-supervision is encouraged where possible, but academic evaluation shall remain under the approved departmental mechanism.

9. Role of the FYP Coordinator

The FYP Coordinator shall manage the overall FYP process at IMCS and ensure transparency, uniformity, quality assurance and proper record keeping.

The coordinator may perform the following functions:

1. Issue call for project proposals.
2. Approve teams and project titles.
3. Allocate or approve supervisors.
4. Review and approve proposals.
5. Schedule progress reviews.
6. Arrange mid and final evaluations.
7. Nominate internal and external evaluators.
8. Maintain FYP records.
9. Resolve disputes among students or with supervisors.
10. Ensure ethical and academic standards.

10. SDG and Thematic Alignment

Every FYP should be aligned with at least one Sustainable Development Goal or a relevant thematic area such as health, education, environment, smart cities, innovation, cybersecurity, agriculture, digital governance or social welfare.

SDG / Theme	Possible Project Area
Health	Disease prediction, hospital system, telemedicine
Education	E-learning, attendance, student analytics
Environment	Pollution monitoring, flood prediction
Smart Cities	Traffic, parking, civic complaint systems
Innovation	AI tools, automation, digital transformation
Cybersecurity	Threat detection, secure systems
Agriculture	Crop monitoring, irrigation automation

The proposal must include a short section titled “SDG / Thematic Alignment”, explaining how the project contributes to society, industry, research, governance, innovation, sustainability or local problem-solving.

11. Proposal Submission

Each team must submit an FYP proposal on the prescribed format. The proposal is the foundation of the project; a weak proposal usually leads to a weak project.

The proposal should include:

1. Project title.
2. Names and roll numbers of students.
3. Program and section.
4. Supervisor name.
5. Problem statement.
6. Background and motivation.
7. Objectives.
8. Scope.
9. Expected users or beneficiaries.
10. SDG/thematic alignment.
11. Existing system or literature review.
12. Proposed methodology.
13. Tools and technologies.
14. Dataset details, if applicable.
15. System architecture or workflow.
16. Expected deliverables.
17. Work plan and timeline.
18. Role of each team member.
19. Ethical considerations.
20. References.

The proposal may be approved, approved with minor changes, returned for revision, merged with a similar proposal, or rejected.

12. FYP-I Roadmap

FYP-I mainly focuses on planning, research, analysis, design and initial development.

Expected work during FYP-I:

1. Finalization of project title.
2. Approval of supervisor.
3. Proposal preparation and defense.
4. Literature review or existing-system analysis.
5. Requirement analysis.
6. Finalization of tools and technologies.
7. System design and diagrams.
8. Dataset identification, if applicable.
9. Basic prototype or proof of concept.
10. FYP-I presentation and viva.

Recommended FYP-I outputs:

- Approved proposal
- Literature review
- Software Requirements Specification or technical specification
- Architecture diagram
- ERD/UML/DFD/use-case diagram, where applicable
- Initial prototype

- Progress log
- Supervisor meeting record

13. FYP-II Roadmap

FYP-II focuses on implementation, testing, evaluation, documentation and final defense.

Expected work during FYP-II:

1. Complete development of system/model/prototype.
2. Testing and debugging.
3. Evaluation of results.
4. Final report writing.
5. Preparation of slides.
6. Preparation of poster.
7. Final demonstration.
8. Final viva voce.
9. Submission of all deliverables.

Recommended FYP-II outputs:

- Complete working system/model
- Final report/thesis
- Source code
- Dataset or dataset access details
- User manual
- Installation/deployment guide
- Testing report
- Final presentation slides
- Poster
- Similarity report
- AI-use declaration, if applicable

14. Evaluation and Assessment

The evaluation shall be conducted in multiple stages, including proposal approval, progress reviews, final presentation/demonstration, report submission and external evaluation where required. The department may modify marks distribution according to approved rules, but evaluation should remain transparent, documented and aligned with FYP learning outcomes.

14.1 Suggested FYP-I Assessment

Component	Marks
Proposal quality	15
Problem statement and objectives	10
Literature review / existing-system study	15
Methodology and technical plan	15
Design and diagrams	15
Initial prototype / proof of concept	15
Presentation and viva	10
Supervisor progress assessment	5
Total	100

14.2 Suggested FYP-II Assessment

Component	Marks
Final system/model/prototype	25
Technical complexity and innovation	15
Testing and evaluation	15
Final report/thesis	15
Presentation and demonstration	10
Individual contribution and viva	10
Code quality, deployment and documentation	10
Total	100

15. Required Deliverables

At the completion of the FYP, students must submit all required deliverables in the format and schedule notified by the department.

1. Final report/thesis.
2. Presentation slides.
3. Working prototype/system/model.
4. Poster or summary document.
5. Source code.
6. Dataset, if applicable.
7. User manual.
8. Installation/deployment guide.
9. Testing report.
10. Similarity report.
11. AI-use declaration, if applicable.
12. Supervisor certificate.
13. Student contribution certificate.

16. Final Report Format

The final report should be written in a proper academic format and should normally contain the following sections:

1. Title Page.
2. Declaration by Students.
3. Supervisor Certificate.
4. Acknowledgement.
5. Abstract.
6. Table of Contents.
7. List of Figures.
8. List of Tables.
9. Chapter 1: Introduction.
10. Chapter 2: Literature Review / Existing System Analysis.
11. Chapter 3: Requirement Analysis and Methodology.
12. Chapter 4: System Design / Architecture.
13. Chapter 5: Implementation.
14. Chapter 6: Testing, Results and Evaluation.
15. Chapter 7: Conclusion and Future Work.

16. References.

17. Appendices.

For software projects, the report should include system requirements, database design, interface design, implementation details, testing and deployment. For AI/data science projects, the report should include dataset details, preprocessing, model selection, training, testing, evaluation metrics, results and limitations.

17. Presentation and Demonstration

Every team must present and demonstrate the project before the evaluation panel. The presentation should be professional, clear and properly timed.

The presentation should include:

1. Project title and team details.
2. Problem statement.
3. Objectives.
4. Existing system or literature gap.
5. Proposed solution.
6. Tools and technologies.
7. Architecture or workflow.
8. Main features.
9. Demonstration.
10. Testing and results.
11. Individual contribution.
12. Conclusion and future work.

During viva, every student must be able to answer questions related to the project. A student who cannot explain the project may receive reduced marks even if the project is working.

18. Poster Guidelines

Each team may be required to prepare a poster for display during project exhibition or evaluation. The poster should be visually clear, concise and professionally designed.

The poster should include:

1. Project title.
2. Student names and roll numbers.
3. Supervisor name.
4. Problem statement.
5. Objectives.
6. Proposed solution.
7. Architecture/workflow diagram.
8. Tools and technologies.
9. Key features.
10. Results or screenshots.
11. SDG/thematic alignment.
12. Conclusion.

The poster should not contain excessive text. Diagrams, screenshots, charts and workflow illustrations are encouraged.

19. Ethical and Professional Requirements

Students must follow ethical and professional standards throughout the FYP. Projects must avoid plagiarism and must properly acknowledge licensed data, copyrighted material, open-source components and AI tools where used.

Students must ensure that:

1. The project is their own work.
2. No project is copied, purchased or outsourced.
3. All sources are properly cited.
4. Licensed datasets, APIs, images, code and libraries are acknowledged.
5. Human data, personal data, medical data, financial data and private information are handled responsibly.
6. Cybersecurity projects are conducted only in legal and controlled environments.
7. AI tools are used responsibly and declared properly.
8. The project does not harm individuals, institutions, systems or society.

20. Plagiarism and AI Use Policy

Plagiarism is a serious academic offence. Students must not copy text, code, diagrams, datasets, reports or project ideas without proper acknowledgement.

20.1 Not Allowed

1. Copying another student’s project.
2. Buying a project from a freelancer or software house.
3. Submitting downloaded GitHub code as original work.
4. Copying thesis/report text without citation.
5. Using AI-generated text without verification and declaration.
6. Hiding the use of external paid help.

20.2 Allowed with Proper Acknowledgement

1. Use of open-source libraries.
2. Use of public datasets.
3. Use of APIs.
4. Use of frameworks.
5. Use of AI tools for assistance.
6. Use of tutorials for learning.

20.3 AI Use Declaration

If students use AI tools such as ChatGPT, Gemini, Claude, Copilot or any other tool, they should declare the name of the tool, purpose of use, type of assistance taken, sections where AI was used and confirmation that the final work was reviewed and verified by students.

21. Progress Monitoring

Students must meet their supervisor regularly. Progress should be properly recorded. A team may not be allowed for final evaluation if it fails to show progress, remains absent from reviews, or does not submit required documents.

Activity	Frequency
Supervisor meeting	Weekly or fortnightly
Progress log	Monthly
FYP Committee review	At least twice per semester
Mid evaluation	Once per semester
Final evaluation	End of FYP-II

22. Change of Topic, Team, or Supervisor

Change of project title, scope, team members or supervisor shall only be allowed with approval of the FYP Committee.

A change may be allowed where:

1. The original topic is not feasible.
2. Required data or hardware is unavailable.
3. The project scope is too broad or too narrow.
4. A team member becomes inactive.
5. Supervisor availability changes.
6. The revised topic is academically stronger.

Major changes should not normally be allowed after the mid-evaluation of FYP-II.

23. Individual Contribution and Disputes

Each student must contribute to the project. If a student does not work, remains absent, or fails to explain his or her part, the supervisor and evaluation panel may award lower individual marks.

In case of dispute:

1. The matter should first be discussed with the supervisor.
2. If unresolved, it should be submitted to the FYP Committee.
3. The committee may call students individually.
4. The committee may revise task allocation.
5. The committee may recommend separate marking.
6. Serious misconduct may be referred for disciplinary action.

24. Final Submission Checklist

Before final evaluation, each team must ensure that the following items are complete:

Sr. No.	Item	Status
1	Final report/thesis	
2	Presentation slides	
3	Working system/model/prototype	
4	Source code	
5	Dataset or dataset link, if applicable	
6	User manual	
7	Installation/deployment guide	
8	Testing report	
9	Poster	
10	Similarity report	
11	AI-use declaration	
12	Supervisor certificate	
13	Individual contribution form	
14	Repository link	
15	Demonstration video, if required	

25. Annexures and Suggested Forms

The following forms may be used by IMCS students for smooth FYP management. IMCS may modify these forms according to their official requirements.

Annexure-A: FYP Proposal Form

Field	Details to be Filled
Project Title	
Student Names and Roll Numbers	
Program and Section	
Supervisor Name	
Problem Statement	
Objectives	
Scope	
SDG / Thematic Alignment	
Proposed Methodology	
Tools and Technologies	
Expected Deliverables	
Timeline	
Role of Each Member	
References	

Annexure-B: Supervisor Consent Form

I, _____, agree to supervise the FYP Project ID: _____ and titled _____ submitted by the following students:

Name	Roll No.	Signature

Supervisor Signature: _____ Date: _____

Annexure-C: Progress Meeting Log

Date	Work Discussed	Tasks Assigned	Supervisor Remarks	Signature

Annexure-D: Individual Contribution Form

Student Name	Roll No.	Assigned Role	Work Completed	Percentage Contribution

Annexure-E: AI Use Declaration

We declare that AI tools were / were not used in the preparation of this project. If used, details are as follows:

AI Tool	Purpose	Section/Task	Verified by Students

Student Signatures: _____ Supervisor Signature: _____

Annexure-F: Final Submission Certificate

This is to certify that the FYP titled _____ has been completed by the students listed below under my supervision and is ready for final evaluation.

Student Name	Roll No.

Supervisor Name: _____

Signature: _____ Date: _____

26. Concluding Note for Students

The Final Year Project is the academic bridge between classroom learning and professional life. A strong FYP can help students build confidence, improve technical skills, create a portfolio, attract employers, support admission to higher studies, and even become the foundation of a startup or research publication.

Students of BS Computer Science at IMCS are expected to complete their FYP with honesty, discipline, innovation, teamwork and professional commitment.

Work regularly. Meet your supervisor. Document everything. Test your system. Understand your project. Present confidently.

References

1. Higher Education Commission, Government of Pakistan. HEC Curriculum Booklet – Computer Science 2025.
2. Higher Education Commission, Government of Pakistan. Annex-B: Final Year Project (FYP) Guidelines – Computing Programs.
3. Higher Education Commission, Government of Pakistan. Undergraduate Education Policy V 1.1 (2023), as referenced in the HEC Computer Science Curriculum 2025.