Semester IV		
IPW681FP: Internship/Project Work (FP/OJT)		
Teaching Scheme: Project **Duration: 3 - 4 Months**	**Credit: 12**	**Examination Scheme:** **Internal (TH)**: 150 Marks **External (TH)**: 300 Marks **Total :450** Marks

Prerequisites:
Knowledge of Software Requirement Specification, technology, tools and techniques.

Course Objectives:
- To Enhance skills in programming, software development methodologies, and proficiency with relevant technologies and tools.
- To Gain hands-on experience in project planning, requirement analysis, design, implementation, testing, and documentation.
- To Improve problem-solving capabilities through practical implementation of projects.
- To Improve presentation skills by effectively communicating project goals, methodologies, results, and conclusions to peers, faculty, and potentially external stakeholders.
- To Foster teamwork and collaborative skills through group-based project work, including the division of tasks, coordination, and communication.
- To Encourage creative thinking and innovation in designing solutions that meet specified requirements and constraints.

Course Outcomes: On completion of the course, learners should be able to

CO#	Cognitive Domain	Course Outcomes
CO1	Apply	Implement solutions by applying programming skills, development methodologies, and relevant tools in real-world contexts.
CO2	Analyze	Evaluate and refine software solutions through comprehensive project planning, requirement analysis, design, implementation, testing, and documentation.
CO3	Evaluate	Assess and troubleshoot complex problems through practical project implementation, refining problem-solving strategies.
CO4	Create	Design and present project goals, methodologies, results, and conclusions effectively to peers, faculty, and external stakeholders.
CO5	Design	Innovate and create original software solutions that meet specific requirements and constraints, fostering creativity and problem-solving skills.

Note: Students have the flexibility to choose any specialization, technology, or combination for their project development. They are encouraged to refer to the general guidelines for a structured approach.

General Guidelines for All Specializations:

1. Project Selection:

- Students can choose any specialization/technology or a combination for their project.
- Topics must align with industry trends and academic relevance.
- Consult with internal guides for topic approval and feasibility.

2. Project Execution:

- Follow the Software Development Life Cycle (SDLC) for systematic execution.
- Use appropriate tools and technologies for design, implementation, and testing.
- Ensure proper documentation, including diagrams, screenshots, and references.

3. Evaluation Criteria:

- Innovation and Problem Definition: 15%
- Implementation and Technical Complexity: 30%
- Resource Utilization and Security: 15%
- Performance and Optimization: 15%
- Documentation and Presentation: 25%

4. Timeline and Milestones:

- Week 1-2: Topic Selection & Approval
- Week 3-4: Literature Review & Requirement Analysis
- Week 5-8: Environment Setup & Initial Development
- Week 9-12: Implementation & Testing
- Week 13-15: Final Documentation & Presentation

5. Plagiarism Policy:

- Projects must be original. Plagiarism beyond 10% will lead to disqualification.

6. Presentation:

- Regular interval presentations to review progress.
- Final presentation to peers, faculty, and external stakeholders.

7. Documentation: Follow a structured format with clear sections.

8. Presentation: Use visuals (diagrams, charts) to enhance understanding.

9. Ethical Considerations: Ensure compliance with ethical guidelines.

10. Teamwork: Collaborate effectively and divide tasks among team members.

Specialization-Specific Guidelines:

Cloud Computing

Project Requirement	Details
Cloud Environment Setup	Use AWS, Azure, GCP, or OpenStack
Service Model	Specify IaaS, PaaS, SaaS, or FaaS
Deployment Model	Public, Private, Hybrid, or Multi-Cloud

Index: Cloud Computing

Chapter	Content	Page Number
Chapter 1	Introduction	
1.1	Company/Institute/Client Profile	
1.2	Abstract	
1.3	Existing System and Need for System	
1.4	Scope of System	
1.5	Objectives	
1.6	Operating Environment (Hardware/Software)	
1.7	Brief Description of Technology Used	
Chapter 2	Technology Used	
2.1	Overview of Study Involved	
2.2	Evaluation of Existing Models	
Chapter 3	Design and Implementation	
3.1	Cloud Service Provider Setup (AWS/Azure/GCP)	
3.2	Performance Metrics (High Availability, Fault Tolerance)	
Chapter 4	Security Implementation	
4.1	Data Encryption, Multi-Factor Authentication, RBAC	
Chapter 5	Deployment, Scalability, and Conclusion	
5.1	Testing and Deployment	
5.2	Interpretation of Results	
5.3	Limitations and Challenges	
5.4	Summary of Objectives and Achievements	
Chapter 6	References	
Chapter 7	Appendices	
Chapter 8	Annexure- Progress Sheet	

Cyber Security:

Project Requirement	Details
Threat Analysis	Identify common and advanced threats (e.g., APTs, ransomware)
Security Controls	Implement network security, IAM, and data protection
Research Focus	Choose AI, IoT, Cloud, or Human Factors in Cybersecurity

Index: Cyber security

Chapter	Content	Page Number
Chapter 1	**Introduction**	
1.1	**Company Profile**	
1.2	**Abstract**	
1.3	**Cybersecurity Fundamentals** 1.3.1 Cybersecurity Fundamentals 1.3.2 Cybersecurity Landscape 1.3.3 Cybersecurity Challenges in Different Sectors	
1.4	**Cybersecurity Landscape**	
1.5	**Cybersecurity Challenges in Different Sectors**	
Chapter 2	**Literature Review**	
2.1	Overview of Existing Research	
2.2	Identification of Research Gaps	
2.3	Relevance to Research Focus	
Chapter 3	**Threat Landscape Analysis**	
3.1	Common Cyber Threats	
3.2	Advanced Persistent Threats (APTs)	
3.3	Threat Actor Profiling	
3.4	Vulnerability Assessment	
Chapter 4	**Security Control and Technologies**	
4.1	Network Security	
4.2	Endpoint Security	
4.3	Identity and Access Management (IAM)	
4.4	Data Protection	
4.5	Security Information and Event Management (SIEM)	

Chapter 5	**Specific Research Focus (Choose any one in isolation or you can combine below topics into one focus area, or a topic approved by your internal guide)**	
5.1	Artificial Intelligence (AI) in Cybersecurity	
5.2	Internet of Things (IoT) Security	
5.3	Cloud Security	
5.4	Human Factors in Cybersecurity	
5.5	Cybersecurity Compliance and Policy	
Chapter 6	**Practical Demonstration and Evaluation**	
6.1	Methodology	
6.2	Conceptual Framework or Proof of Concept (if applicable)	
6.3	Evaluation Metrics (if working model/ tool is developed)	
Chapter 7	**Discussion and Future Directions**	
7.1	Analysis of Results	
7.2	Real-World Applications	
7.3	Limitations and Considerations	
7.4	Future Research Avenues	
Chapter 8	**Conclusion**	
Chapter 9	**Bibliography**	
Chapter 10	**Plagiarism Report**	
Chapter 11	**Annexure- Progress Sheet**	

AI/ML/DL/Data Science

Project Areas

Students may choose projects in, but not limited to, the following areas: Machine Learning (ML) and Deep Learning (DL), Natural Language Processing (NLP), Computer Vision, Predictive Analytics, Big Data Analytics, Reinforcement Learning, AI-driven Automation, Data Visualization, AI Ethics and Responsible AI

Project Requirement	Details
Data Collection	Use real-world datasets or APIs
Model Development	Implement ML algorithms (e.g., regression, classification)
Evaluation	Use metrics like accuracy, precision, recall, and F1-score

Index: AI/ML/DL/Data Science

Chapter	Content	Page Number
Chapter 1	Introduction	
1.1	Problem Statement	
1.2	Objectives	
1.3	Dataset Description	
Chapter 2	Literature Review	
2.1	Existing Research	
2.2	Research Gaps	
Chapter 3	Methodology	
3.1	Data Preprocessing	
3.2	Model Selection	
3.3	Implementation	
Chapter 4	Results and Discussion	
4.1	Model Performance	
4.2	Visualization	
4.3	Insights	
Chapter 5	Conclusion	
5.1	Summary	
5.2	Future Work	
Chapter 6	References	
Chapter 7	Appendices	
Chapter 8	Annexure- Progress Sheet	

Development (Web/Mobile Applications, ETL)

Project Requirement	Details
Technology Stack	Use frameworks like React, Angular, or Flutter
Database	Implement SQL or NoSQL databases
Testing	Perform unit testing, integration testing, and user acceptance testing

Index: Development (Web/Mobile Applications, ETL)

Chapter	Content	Page Number
Chapter 1	Introduction	
1.1	Problem Statement	
1.2	Objectives	
1.3	Scope	
Chapter 2	Design	
2.1	System Architecture	
2.2	Database Design	
Chapter 3	Implementation	
3.1	Frontend Development	
3.2	Backend Development	
3.3	Integration	
Chapter 4	Testing	
4.1	Test Cases	
4.2	Results	
Chapter 5	Conclusion	
5.1	Summary	
5.2	Future Enhancements	
Chapter 6	References	
Chapter 7	Appendices	
Chapter 8	Annexure -Progress Sheet	

Research-Based Projects

Project Requirement	Details
Literature Review	Comprehensive review of existing research
Methodology	Define research design, data collection, and analysis methods
Contribution	Identify gaps and propose innovative solutions

Index: Research-Based Projects

Chapter	Content	Page Number
Chapter 1	Introduction	
1.1	Research Problem	
1.2	Objectives	
Chapter 2	Literature Review	
2.1	Existing Research	
2.2	Research Gaps	
Chapter 3	Methodology	
3.1	Research Design	
3.2	Data Collection	
3.3	Analysis Methods	
Chapter 4	Results and Discussion	
4.1	Findings	
4.2	Implications	
Chapter 5	Conclusion	
5.1	Summary	
5.2	Future Work	
Chapter 6	References	
Chapter 7	Appendices	
Chapter 8	Annexure -Progress Sheet	

IoT Based Project

I. Introduction of Smart System

These guidelines provide a structured framework for MCA students undertaking internships or projects in Internet of Things (IOT). The experimental Model required to make an enhanced Smart System. Inventing Model of usual use of Smart System

II. Scope

The System must be enclosed with more than 5-6 Sensors and complete one specific group. (Example if Smart City - Smart transport, Smart parking   Smart Road, Smart water System etc) Smart Colleges – Classroom, Smart Laboratory, etc.)

- Smart systems must align with use of IOT devices
- Must be show working Model
- Data captured by an IOT device must be stored / reflected in an automated format.

Considerations:

- Security aspects of Captured Data in the cloud

IOT Model: Students may choose projects in, but not limited to, the following areas:

- ·   Internet of Things and Blockchain
- IOT and Big data
- IOT and AI
- IOT and Machine learning

Index: IoT Based Project

Chapter	Content	Page Number
Chapter 1	**INTRODUCTION**	
1.1	Company Profile / Institute Profile / Client Profile	
1.2	Abstract	
1.3	Existing System and proposed System	
1.4	Scope and Objectives	
1.5	Operating Environment – Hardware and Software	
1.7	Brief Description of Technology Used IOT Introduction (Architecture) Operating Systems used (Windows or Unix) Cloud Database	
Chapter 2	**Proposed System**	
2.1	Previous Work / Research	
2.2	Target Users of Smart Model	
2.3	Role of Sensors and Actuators in IOT	
Chapter 3	**Proposed IOT Model Design and Implementation**	

3.1	Choice of Sensors and Actuators in proposed IOT Model	
3.2	Working of IOT Model	
3.3	Design of Proposed IOT Model	
3.4	Flow of Proposed IOT Model	
Chapter 4	**Architecture of Smart System**	
4.1	Overview of Proposed Smart System	
4.2	Description of IOT proposed Model Architecture	
Chapter 5	**IOT Model Details**	
5.1	Choice of IOT Platforms and Integrated Tools (Ardunio, Raspberry pi)	
5.2	IOT Devices in Proposed System	
5.3	Description of Input and Output Components (Sensors, Actuators, USB Cables, Processor, Micro Electronic Chips, Boards , IC chips, power supply etc)	
Chapter 6	**Development and Implementation of Model**	
6.1	Code Implementation	
6.2	Procedure of Database Connection (Local, Cloud)	
6.3	Screenshots (Sample output Results)	
Chapter 7	**Testing of IOT Model**	
7.1	Testing Strategy and Methodology	
7.2	Testing of Sensors and Actuators	
7.3	Testing of proposed IOT Model	
Chapter 8	**Conclusion**	
8.1	Summary	
8.2	Limitations and Challenges	
8.3	Future Scope	
Chapter 9	**References/Bibliography**	
Chapter 10	**Appendices**	
10.1	Cost and Resources Estimation	
Chapter 11	User Manual of Model	
Chapter 12	**Annexure -Progress Sheet**	

Internship/Project Work (FP/OJT)
Progress Sheet Academic Year (2025-26)

Name of Student	
Class	
Name of the Project guide	
Project Title	
Front end	
Backend	
Company Name	

Sr. No.	Activities to be completed	Expected Date of completion	Actual Date of completion	Sign of Student	Sign of Guide
1	Meeting with project Guide, Preliminary discussion				
2	Company Internship Letter Submission				
3	**Project Synopsis**, (Project Title, Company, Objectives and Scope, about the project, hardware and software requirement)				
4	SRS Requirement Model (Functional & non-functional Requirements), Functional Model (Use case Diagram) and Activity Diagram				
5	Structural Models created using UML: Class Diagram Behavioral Models created using UML: Sequence Diagram, Object Diagram state transition diagrams, Component diagram and Deployment Diagram				
6	**First Presentation** – Submit printed report, duly signed by guide, presentation Viva				
7	Table design, Data dictionary, Menu , Website map, list of report and screens, Source code, test cases, test plan, User manual				
8	**Second Presentation** – Submit printed report, duly signed by guide, presentation Viva				
9	Submission of draft copy of report, duly signed by guide				
10	**Final Submission-** Submission of the black rexine-bound report with golden embossing.				

Internal Project Guide   Director/Head

This is a sample progress sheet for Full Stack Development.
You can adjust your progress tracking sheet as per your specialization or project domain
(e.g., Data Science, Mobile App Development, Cybersecurity, etc.).