

University Guideline

Practical Training and Project Work:

At the end of the sixth semester of study, a student will be examined in the course "Project work".

1. The Major Project work will be started in Semester V. It may be done individually or in groups in case of bigger projects. However if project is done in groups, each student must be given a responsibility for a distinct module and care should be taken to see the progress of individual modules is independent of others.

2. Students should take guidance from an internal guide and prepare a Project Report on "Project Work" back to back print (one copy) which is to be submitted to the Director of the Institute.

Wherever possible, a separate file containing source-code listings should also be submitted. Every student should also submit soft copy of their project synopsis. Their respective Institutes should forward the copy of this synopsis to the external panel members, in advance of the project viva dates if asked for.

3. The Project Synopsis should contain an Introduction to Project, which should clearly explain the project scope in detail. Also, Data Dictionary, ERDs, File designs and a list of output reports should be included if required as per the project title and scope.

4. The project Work should be of such a nature that it could prove useful or be relevant from the commercial/management angle.

5. Student must start an industrial project from semester-V and same project must be carried for semester-VI.

6. Selected project must have relevant scope for 500 marks.

7. Selected project must belongs to respective track of the student only (Interdisciplinary project may selected with prior permission of project guide).

8. In the fifth semester, student must visit at least once in a week to the respective company.

9. In the sixth semester, student must visit at least once in a week to the institute and the progress of the project must be communicated to college project guide.

10. The project report will be duly accessed by the internal guide of the subject and marks will be communicated by the Director to the University along with the marks of the internal credit for theory and practical to be communicated for all other courses.

11. The project report should be prepared in a format prescribed by the University, which also specifies the contents and methods of presentation.

12. The major project work carry 250 marks for internal assessment and 250 marks for external viva.

The external viva shall be conducted by a minimum of one external examiner. The mini project work would be departmental.

13. Project work can be carried out in the Institute or outside with prior permission of the Institute.

14. Project viva-voce by the University panel will be conducted in the month of April-May.

Track I Projects

1. Web based Application

CHAPTER 1 : INTRODUCTION

- 1.1 Company Profile
- 1.2 Introduction
- 1.3 Existing System and Need for System
- 1.4 Limitations of existing system

CHAPTER 2 : PROPOSED SYSTEM

- 2.1 Problem statement/s
- 2.2 Product position statement
- 2.3 Product overview
- 2.4 Summary of capabilities
- 2.5 Assumptions and dependencies
- 2.6 Objectives of proposed system
- 2.7 Functional requirements
- 2.8 Nonfunctional requirements
- 2.9 Stakeholder summary
- 2.10 Users summary
- 2.11 Scope of the system
- 2.12 Module specifications
- 2.13 Operating environment

CHAPTER 3 : REQUIREMENT DETERMINATION AND ANALYSIS

- 3.1 Fact finding methods
- 3.2 Feasibility study

CHAPTER 4 : SYSTEM ANALYSIS & DESIGN

- 4.1 Use Case Diagrams
- 4.2 Sequence Diagram
- 4.3 Activity Diagram ERD
- 4.4 Class Diagram
- 4.5 Object Diagram
- 4.6 Module Hierarchy Diagram
- 4.7 Component Diagram
- 4.8 Deployment Diagram (in case of Web Deployment)

- 4.9 Module Specifications
- 4.10 Interface Diagram (in case of WAP and Embedded Systems)
- 4.11 Web Site Map Diagram in case of Web Site)
- 4.12 User Interface Design (Screens etc.)
- 4.13 Table specifications (in case back end is a database)
- 4.14 Test Procedures and Implementation

CHAPTER 5 : USER MANUAL

- 5.1 User Manual
- 5.2 Operations Manual / Menu Explanation
- 5.3 Program Specifications / Flow Charts

Drawbacks and Limitations

Proposed Enhancements

Conclusion

Bibliography

ANNEXURES:

ANNEXURE 1 : USER INTERFACE SCREENS

ANNEXURE 2 : OUTPUT REPORTS WITH DATA (if any)

ANNEXURE 3 : SAMPLE PROGRAM CODE / Project Demo(which will prove sufficient development is done by the student)

2. Embedded Systems

CHAPTER 1 : INTRODUCTION

- 1.1 Company Profile
- 1.2 Existing System and Need for System
- 1.3 Scope of Work
- 1.4 Operating Environment - Hardware and Software
- 1.5 Detail Description of Technology Used

CHAPTER 2 : PROPOSED SYSTEM

- 2.1 Proposed System
- 2.2 Objectives of System
- 2.3 User Requirements

CHAPTER 3 : ANALYSIS & DESIGN

- 3.1 Block Diagram
- 3.2 Architecture Diagram
- 3.3 Class Diagram
- 3.4 Flowchart/ Activity Diagram
- 3.5 Sequence Diagram
- 3.6 Component Diagram
- 3.7 Deployment Diagram
- 3.8 Interface Diagram

CHAPTER 4 : USER MANUAL

- 4.1 User Manual
- 4.2 Operations Manual
- 4.3 Program Specifications / Flow Charts

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3. Mobile Applications

CHAPTER 1 : INTRODUCTION

- 1.1 Company Profile
- 1.2 Existing System and Need for System
- 1.3 Scope of Work
- 1.4 Operating Environment - Hardware and Software
- 1.5 Type of Mobile Application – Native /Hybrid
- 1.6 Detail Description of Technology Used

CHAPTER 2 : PROPOSED SYSTEM

- 2.1 Proposed System
- 2.2 Objectives of System
- 2.3 User Requirements

CHAPTER 3 : ANALYSIS & DESIGN

- 3.1 Object Diagram
- 3.2 Class Diagram
- 3.3 Use Case Diagrams
- 3.4 Module Hierarchy Diagram
- 3.5 Component Diagram
- 3.6 Deployment Diagram (in case of Web Deployment)
- 3.7 Module Specifications
- 3.8 Interface Diagram (in case of WAP and Embedded Systems)
- 3.9 Web Site Map Diagram (in case of Web Site)
- 3.10 User Interface Design (Screens etc.)
- 3.11 Table specifications (in case back end is a database)
- 3.12 Test Procedures and Implementation

CHAPTER 4 : USER MANUAL

- 4.1 User Manual
- 4.2 Operations Manual / Menu Explanation
- 4.3 Program Specifications / Flow Charts

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ANNEXURE 3 : SAMPLE PROGRAM CODE / Project Demo(which will prove sufficient development is done by the student)

Note:

1. **10% change in design is acceptable in Semester VI**
2. **All relevant diagrams from chapter 3 for the system developed should be drawn**

TRACK III Projects

1. Testing Project

CHAPTER 1 : INTRODUCTION

- 1.1 Company Profile
- 1.2 About the System under Test
- 1.3 Scope of Work
- 1.4 Operating Environment - Hardware and Software
- 1.5 Detailed Description of Tool(s) Used in Testing

CHAPTER 2 : TEST PLANNING

- 2.1 Objectives of Testing
- 2.2 Software Requirement Specification
- 2.3 Master Test Plan (IEEE format)
- 2.4 Review of Test Basis (prototype testing)

CHAPTER 3 : TEST ANALYSIS & DESIGN

- 3.1 Use Case Diagram of the System
- 3.2 Module Hierarchy Diagram
- 3.3 Unit Test Plan
- 3.4 Test Harness
- 3.5 Development of Test Scenario as per requirements
- 3.6 Requirement Traceability Matrix (Horizontal traceability)
- 3.7 Test Case Design
- 3.8 Test Data Generation
- 3.9 Test Execution
- 3.10 Defect Screens (Snapshots)
- 3.11 Test Log
- 3.12 Defect Report
- 3.13 Defect Metrics (List of all defect metrics employed and its values)
- 3.14 Test Summary Report

CHAPTER 4: USER (TESTER) MANUAL

- 4.1 Test Procedure Specification
- 4.2 Test Scripts
- 4.3 RTM (vertical traceability)
- 4.4 Configuration Management (Test Item transmittal Report)

Drawbacks and Limitations
Conclusion

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ANNEXURES:

ANNEXURE 1 : USER INTERFACE SCREENS used for testing

ANNEXURE 2 : Test Log

2. ETL Project

The following could be considered to be the different phases involved in an ETL project development life cycle.

1. Chapter 1 : INTRODUCTION

- a. Company Profile
- b. Existing System functionality (Source System for which the ETL is being developed)
- c. Scope of Work for the ETL project (Target System)
- d. Operating Environment - Hardware and Software & Description of Tools / Technology to be used in the Target system
 - i. O/S to be used (Windows or Unix)
 - ii. RDBMS required to build database (oracle, Teradata etc)
 - iii. ETL tools required (Informatica, Datastage etc)
 - iv. OLAP tools required (Cognos ,BO)

2. Chapter 2 : PROPOSED SYSTEM

- a. Business Requirements Collection
 - i. BR collection takes place at client location.
 - ii. Identify the KPI (Key Performance Indicators required in the business domain of source system)
 - iii. The o/p from BR Analysis are BRS Business Requirement Specifications (Business specific Rules to be mentioned here from analysis point of view)
 - iv. Identify the dimensions, required attributes, measures, filter conditions , adjustments for KPIs going to be used in the Target system and its availability in the Source System. If any gaps suggest remediation of gaps.
- b. Objectives the Target System
- c. Establish the User Acceptance Criteria

3. Chapter 3: ANALYSIS & DESIGN

- a. Use Case / Module Hierarchy Diagram of Source System (to depict its functionality/behaviour)
- b. High Level Design of Target system (Elaborate the tiers of DW architecture in the Target System)
- c. Low Level Design of Target system
 - i. Database schema / Table specifications of Target system

- ii. Details of Source & Targets of mapping in the database
- iii. Details of Load (Full/Incremental etc)
- d. Deployment / Component Diagram of Target system

4. Chapter 4 : DEVELOPMENT & TESTING PHASE

- a. Code review (Code or logic used for mapping Source system to Target system)
- b. Unit Testing (A unit test for the DW is a white Box testing & it could check the ETL procedure and Mappings). The following are the test cases that could be executed by an ETL developer:
 - Verify data loss
 - No. of records in the source and target
 - Data accuracy
 - Verify column Mapping
 - Verify Naming standards.
 - Loading technique used (Incremental /Full etc)
- c. Integration Testing
 - Run all the mappings in the sequence order from source to stage mappings
 - Then run the mappings related to dimensions and facts in the final DW
 - Any UAT tests that could be done at user site to verify the output of ETL

5. Chapter 5 : USER MANUAL

- a. Process flow diagram as an operations manual (execution of ETL process)

6. Drawbacks and Limitations

7. Proposed Enhancements

8. Conclusion

9. Bibliography

10. Annexure

- a. USER INTERFACE SCREENS
- b. ANY OUTPUT REPORTS WITH DATA
- c. SAMPLE PROGRAM CODE (of the ETL process)

3. Data Mining Project

The goal of Data Mining Project is to give hands-on experience of applying data mining techniques to one or more large data sets, going through the following steps:

1. Identifying a data set and problem domain
2. Deciding on what you want to achieve with data mining
3. Choosing appropriate methods and algorithms
4. Implementing and testing your methods
5. Evaluating your techniques on your data sets
6. Reporting conclusion

Contents for Project report

1. Data description
2. Problem definition
3. Data pre-processing
4. Data mining algorithms used and why
5. Evaluation, graphs of experiments, result tables
6. Screen shots if the program has an interesting user interface
7. Discussion on what was hard to achieve, limitations
8. Observations and conclusions

TRACK IV Projects

Students can select a project from the following categories.

1. Network Design and Implementation Projects
2. Network Security Projects
3. Projects Involving Emerging Internet and Network Technologies
4. Network Performance Studies

Detailed guidelines for each type of project:

1. Network Design and Implementation Projects

- Infrastructure requirement (Server, Switches, Routers, Wireless Access point, firewall etc.)
- Setting up a small network, which includes bringing together different types of equipment and evaluating the configuration settings each one offers and how easy or difficult it is to get particular types of connections working.
- Projects may involve the planning for large computer networks such as those used by schools, businesses, internet service providers and data centers. (VLAN, VTP, VOIP etc.)
- Network capacity planning which includes estimation of equipment costs, layout decisions and consideration of the software and services the network can support.
- A project can also involve studying the design of existing networks such as those of a school and identifying ways to improve them.

2. Network Security Projects

Project that test the security level of a computer network setup/demonstrate ways that security can be breached.

- Students can design a project that runs network sniffers [tcpdump, CloudShark, Cain and Abel, Microsoft Message Analyzer, CommView, Omnippeek, Capsa, Ettercap, PRTG, Free Network Analyzer, NetworkMiner, IP Tools] to capture traffic sent over a network connection and identify all the different network protocols it is using.
- A project measures the effects of antivirus software on a computer's processor utilization and performance, with or without a look at the effectiveness of antivirus software in preventing network worms, trojans and viruses. [This is just an indicative parameter but students must identify other such parameters.]
- Switch Security
- Router security
- Wireless access point security
- Firewall security
- Students can develop a project around building a network firewall application, simulation tools etc.

3. Projects Involving Emerging Internet and Network Technologies

Technologies like Internet of Things (IOT) and Unified communication (UC) expected to be installed and configured by the students as experimenting with such technologies that are currently burning in the industry can be a great way to learn about their real-world benefits and limitations.

For example, a project could investigate what it would take for a family to retrofit their existing home appliances, lighting or security system to work as Internet of Things (IOT) gadgets and what interesting usages those setups might have.

UC projects implements different components like.

- Call control and multimodal communications
- Presence
- Instant messaging
- Unified messaging
- Speech access and personal assistant
- Conferencing -- audio, Web and video
- Collaboration tools
- Mobility
- Business process integration (BPI)
- Software to enable business process integration

4. Network Performance Studies

Students can assess the performance characteristics of local networks and internet connections under varying conditions. Examples include

- A project could measure the actual data transfer rates and the latency of real network applications, along with the effects of network traffic congestion on applications.
- Measuring the effects of physical obstructions or sources of wireless interference such as microwave ovens on active network connections is an informative project.
- A project could compare performance differences between different types of network hardware such as routers from different manufacturers or operating systems such as between Windows and Linux.
- Compare and contrast the performance of software & database applications such as Web servers.

- A comparative analysis of different wireless technologies on simulator w.r.t. Download speed, Upload speed, Approximate Maximum Range in Meters, Typical Download throughput. [These are indicative parameters students must identify other such parameters].

Note: Chapter scheme for Track-IV projects will be shortly communicated.

