

॥ अंतरी पेटवुं ज्ञानज्योत ॥



**North Maharashtra University,**

**Jalgaon**

Syllabus for

**Diploma in Software Technology  
and Management**

(w.e.f. July, 1999)

**Syllabus for Advanced Diploma in Software Technology and Management**

**From Academic Year 1999-2000**

**(I) Introduction :**

1. The name of the programme shall be Advanced Diploma in Software Technology and Management
2. The A.D.S.T.M. Programme will be a Part-time one year Advanced Diploma in Software Technology and Management it will consist of 7 papers of 700 marks (including Practicals and a Project Work) as mentioned below :

- \* Visual C++
- \* Software Engineering
- \* Introduction to internet and Java Programming
- \* Introduction to Oracle
- \* Visual Basic
- \* Business Application
- \* Practicals
- \* Project work and Viva

3. Special emphasis be placed on practical training in the course
4. Ordinarily, in each class, not more than 60 students be admitted.
5. At least two visits to a large Computer Centre be arranged by the Institute.

**(II) ELIGIBILITY FOR ADMISSION:**

Graduates of any statutory University or Diploma awarded by recognised Board of Technical Educations of State or Central Govt. & 10+2 Higher Secondary Examination with English Subject.

**(IV) Project Work and Practicals;**

As a part of the course students will have to complete their project work under the guidance of internal guide and prepare a project report in 2 copies to be submitted to the Principal/Director.

Project Work may be done individually or in a group of two students. However if project is done in group, each student must be given a responsibility for a distinct module and care should be taken to see that progress of individual modules is independent of others.

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

The project report will be duly assessed by the internal guide of the subject. It is expected that work on the project should commence from November and should be over by February of that Academic Year. Mark will be communicated by the Director to the University after receiving the Seat numbers form the University along with the marks of the internal credit for theory and practicals to be communicated for all other courses.

The project work will carry 40 marks for internal assessment and 60 marks for external viva. The external viva will be conducted by a minimum of two external examiners.

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

The external viva-voce examination for Project Work would be held in March/April.

Journals to be prepared for all practicals subject, including Commercial Applications.

**(V) Assessment:**

The final total assessment of the candidate is made in terms of an internal assessment and an external assessment for each course.

- (a) For each paper, 40% marks will be based on internal assessment and 60% marks for year end examination (external assessment), unless otherwise stated.
- (b) The division of the 40% marks allotted to internal assessment of theory papers is on the basis Written test and tutorials
- (c) The internal marks will be communicated to the University at the end of each year, but before the year end examinations. These marks will be considered for the declaration of the results.

**(VI) Examination:**

Examination shall be conducted at the end of the year i.e. during April/May. The viva for project report shall be normally arranged prior to the External Examination.

**(VII) Standard of Passing Class Awarded**

Every candidate must secure 50% Marks in aggregate and for external examination 24 out of 60 marks and for internal examination 16 out of 40 marks. For Passing in the semester examination a candidate must secured minimum 40% marks in each individual paper & internal marks separately prescribed for the semester.

- 1. Aggregate 70% and above .. First Class with Distinction
- 2. Aggregate 60 % and above .. First Class
- 3. Aggregate 50% and above .. Second Class
- 4. Below 50 % .. Fail

**(VIII) Medium of Instruction :**

The medium of Instruction will be English.

NORTH MAHARASHTRA UNIVERSITY, NAGPUR.  
SYLLABUS FOR  
ADVANCED DIPLOMA IN SOFTWARE TECHNOLOGY AND MANAGEMENT  
(With effect from July 1999)

101. VISUAL 'C' ++  
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Windows Concepts : Windows Environment, Graphics User Interface, Multitasking Environment, Queued Input, Windows messages and OOPs, Memory Management Hardware Independence, dynamic Link Libraries, Windows Executable Format, Windows Programming Concepts and Vocabulary.

OOPs and Windows : Icons, Cursors, Carets, Message Boxes, Dialog Boxes, Fonts, Bitmaps, Pens, Brushes etc.

Windows Messages: Message Format, Generating and Responding to Messages, Message Loop, Procedure Oriented Windows Applications.

Introduction to the MFC Library : MFC Design Considerations, MFC Library Features.

Concepts such as Device contexts, Processing user input, Vector graphics and text, Raster Graphics and Palettes, Designing Own Classes. Document and View architecture, Printing and Print Preview.

Windows Controls : Button and Scrolling controls, List Box, Edit and Combo box controls, Image List, List View, Tree View, Progress bar, Tab and Rich Edit controls, Toolbars, Statusbars and Tooltips, Deriving Custom Controls.

Resources : Icons, Cursors, Bitmaps, Menus, Accelerators and string tables Version information, and user defined resources.

Dialog Boxes and File Input/Output : Common Dialog Boxes and Custom Dialog Boxes, File I/O and the Registry.

102. SOFTWARE ENGINEERING  
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1. System concept, Integrated systems, sub-systems, modules.
2. Role of Systems analysts and others in system development.
3. General phases of System Development Life Cycle. Feasibility Study, Requirements Capture, Detailed. Systems Analysis, Systems Design, Testing, On-Site Implementation and Maintenance..
4. Fact finding Methods.

5. Different Approaches to Software Development.

\*Classic Method : Waterfall Model.

\*Prototyping.

\*Spiral Model.

\*4 GL or Data Oriented Approach.

6. Structured Analysis and Design method and Software Engineering techniques, Tools and Methodologies in Systems Development.

Application System Modelling.

Data Modelling : Entity Relationship method

Process Modelling : Data Flow Diagrams

Concepts of Object Oriented Modelling

Temporal Modelling : State transition Diagrams

#### Database Design Methods

Mapping E-R model to arrive at the Database Design  
Normalisation Technique for Database Design  
Controlled De-Normalisation

#### System Documentation Techniques

System Flow Charts  
Functional Decomposition Diagrams  
Structure Charts  
Structured Flow Charts (N-S Diagrams)

#### Logic Representation Techniques

Decision Trees  
Decision Tables  
Pseudocode and Structured English

#### 7. User Interface Design

Menu, Screen and Report Layouts designing  
The Mode/style of interaction between the system and user.

#### 8. Codes Designing for field values

Designing Code-less system

#### 9. Introduction to Computer Aided Software Engineering (CASE)

Centralised Data Dictionaries  
Diagrammers, Database Designer, Code generator in CASE  
tools, tools for Static and Dynamic Analysis of programs and  
Impact analysis for introducing changes.

#### 10. Types of Data Processing

The concept of Reverse Engineering.  
Batch, On-line and Real Time processing.

Books : Roger Presman - Software Engineering  
James Sen - System Analysis

### 103. INTRODUCTION TO INTERNET AND JAVA PROGRAMMING

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1. Introduction to Internet
2. Introduction HTML Prog.
3. Applet fundamental
4. Variable Scope
5. AWD ( abstract window Tool)

Ref. Book 1. Introduction to Java : Balguruswamy  
2. Java Reference : Petric of Norton.

### 104 INTRODUCTION TO ORACLE

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- 1.1 Basic concepts of Database
- 1.2 Introduction & comparison between DBMS & RDBMS
- 1.3 Advantages of RDBMS over DBMS
- 1.4 Oracle - A Relational Database Management system
- 1.5 Comparison between different Oracle Products  
Professional Oracle, Oracle unex UNIX, personal Oracle,  
Etc.
- 1.6 Database Administrator (DBA)
- 1.7 Database Users
- 1.8 Concept of Normalization including 1NF, 2NF, 3NF

## 2-INTERFACING WITH ORACLE DATABASE

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- 2.1 Basics of structured Query Language (SQL)
- 2.2 Data Definition Language (DDL) statements
  - Creating a table by CREATE TABLE
  - Modifying a table by ALTER TABLE
  - Deleting a table by DROP TABLE
  - Displaying a structure of table by DESCRIBE
  - Renaming a table by RENAME
- 2.3 Data Manipulation language (DML) statements
  - Inserting Record by INSERT
  - Updating Record by UPDATE
  - Deleting Records by DELETE,
- 2.4 Data control Language (DCL) Statements
  - COMMIT, ROLLBACK, GRANT, REVOKE
- 2.5 Concept of Views
- 2.6 Database constraints
  - NULL/NOT NULL, CHECK, UNIQUE, DEFAULT, PRIMARY KEY, FOREIGN KEY
- 2.7 The ORACLE Data Types

## 3- INVOKING SQL \* PLUS

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- 3.1 Basic structure of a query with SELECT, FROM, WHERE
- 3.2 Selecting specified rows & columns through SQL
- 3.3 Operators in ORACLE
  - Arithmetical, Relational & Logical
- 3.4 Pattern Matching using LEKE
- 3.5 Arranging the data by ORDER BY, GROUP BY, HAVING
- 3.6 Checking data by IN, BETWEEN, ALL, ANY, EXISTS, etc
- 3.7 Joining multiple tables using UNION, INTERSECT & MINUS
- 3.8 Working with ORACLE functions
  - Arithmetical functions - ABS(), MOD(), CEIL(), FLOOR(), ROUND (), TRUNC(), SQRT(), SIGN(), POWER().
  - Character functions LOWER(), UPPER(), INITCAP(), LENGTH(), INSTR(), SUBSTAR(), LTRIM(), RTRIM(), LPAD(), RPAD(), CHAR(), ASCII(), etc
- 3.9 Queries using multiple Tables
- 3.10 Subqueries/Nested Queries

## 4- PROGRAMMING IN ORACLE WITH PL/SQL

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- 4.1 Basics of PL/SQL
  - Additional Data types, Variables, constants
- 4.2 Structure of PL/SQL BLOCK
  - DECLARE, BEGIN, EXCEPTION
- 4.3 Handling Tables in PL/AQL
- 4.4 Manipulation data from databases using PL/SQL
- 4.5 Cursor Management
  - Opening a cursor
  - Defining a cursor
  - Fetching a cursor
  - Closing a cursor
  - Handling cursors using % FOUND, %NOTFOUND, % ROWCOUNT
  - Explicit and Implicit cursors
- 4.6 Conditional Statement IF-ELSE-EMDIP
- 4.7 Looping Statements LOOP-ENDWOP, WHILE, FOR
- 4.8 Displaying messages on screen DBMS-OUTPUT. PUT-LENE()

## 5 - PROCEDURES, FUNCTIONS & TRIGGERS

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- 5.1 Introduction to procedures & functions
- 5.2 Basic structure of Procedure/function
- 5.3 Calling a Procedure/function
- 5.4 Concept of stored Procedures & Stored Functions
- 5.5 Concept of Triggers
- 5.6 Types of Triggers
- 5.7 Creating Triggers
- 5.8 Dropping Triggers

## 6 FORMS 4.5

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- 6.1 Introduction to forms 4.5
- 6.2 Properties Windows and layout Editor, Blocks and Items  
Defining Items
- 6.3 Triggers, Canvas-views and windows, Master/Detail  
relationship
- 6.4 Alerts and Edotprs. LOVs, Record groups, Libraries
- 6.5 Manipulating properties and Property Classes, Form  
Parameters,

## 7. REPORTS 2.5

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- 7.1 Introduction to Report 2.5, Creating Default Reports
- 7.2 Creating a Simple Break Report, Creating Detailed Break  
Report
- 7.3 Matrix, Form Letter types of Reports.

### REFERENCE BOOKS

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- 1. Understanding Oracle - by James T. Perry
- 2. Oracle 7.0 by Ivan Bayross
- 3. Commercial Applications Development using Developer 2000 - by  
Ivan Bayross
- 4. Personal Oracle for Windows-95 by David Lockman
- 5. Oracle 7.3 Developers Guide by Singh, Leigh, Zafian

### ORACLE PRACTICALS

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- 1. Informations about 'Loading a ORACLE'
- 2. Handling Tables in ORACLE  
Using create Table, Alter Table, Drop Table, Describe Table,  
Renaming Tables.
- 3. Manipulating Data from a Table  
Using Insert, Delete, Update
- 4. Displaying Data through SQL  
Using - SELECT, FROM, WHERE  
- Order By, Group by, Having Clauses  
- Arithmetical, Relational & Logical Operators  
- in, Between, all, any
- 5. More on Queries  
Using - Arithmetical, Character, Date, conversion and  
Aggragate functions  
- Intersect, Union & Minus joining  
- Multiple Table Handling  
- Nested Queries
- 6. Programming with PL/SQL  
- Simple PL/SQL Blocs  
- PL/SQL Blocks using crursor  
- Application Programs using PL/SQL
- 7. Create & Execute a sample FORM using SQL\* FORM
- 8. Create & Execute a sample Report using SQL\*REPORT WRITER

## 104. VISUAL BASIC

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- 1) Introduction to Visual Basic - Tool Box, Project Window, Property Windows, Menu design windows, etc.
- 2) Writing a program - Visual basic programming Language DIM, Data types, arrays, Control Array,, Option Explicit, Subroutines, Functions, String manipulation function, arithmetic functions
- 3) Making Decisions - If.....Then, If .....Then..... Else, Select case - For ..... Next, Do ..... Loops .....
- 4) Forms, Controls and properties, Labels, Text Boxes, Command, Combos, Lists, Combo Box, Grid, Buttons, Frames, Check Boxes, etc. Forms, Code Modules, Class Modules.
- 5) Error handling using ..... on Error statement, on Error GOTO, etc.
- 6) Working with files
- 7) Using Menu Design Windows, Adding items to a Menu, Assigning shortcut Keys, Creating a Dialog Box
- 9) Using Data Controls, DAO objects, Workspace, Database, Recordset etc, Using Visual Basic as front end tool for MS-ACCESS. RDO and ODBC through Visual Basic, Using Crystal Reports.

## PRACTICALS IN VISUAL BASIC

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1. Program to demonstrate various Visual Basic controls such as Scrollbar, Check box, Combo list, Combo box, text box, labels, Radio buttons, Push buttons etc.
2. Design a program to simulate a calculator.
3. Design a Visual Basic application that will demonstrate concept of files. The applications should make use of File Open and File Save Dialog boxes. (Use common dialog box controls)
4. Design a Paintbrush like Graphical editor. (Save and load bitmaps)
5. Develop a short project using data controls and Data Form wizard Develop reports using Crystal Reports. (Use Data Manager to create the database)

## 105. BUSINESS APPLICATIONS

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1. Financial Accounting :  
Introduction to computerised accounting system Coding Methods  
By Books, Ledger, Trial Balance, Balance Sheet, Profit and Loss Account.  
Input Controls-Audit Trail.  
Management and statutory reporting.
2. Fixed Deposit System :  
Types of deposit schemes-Category or Depositors Statutory Provisions,  
Interest Warrants and Deposit Register.  
Maturity and Renewal Procedures.  
Statutory and Management Reports.  
Payroll Processing :  
Payslip Printing.  
Statutory Reports such as P.F., E.S.I, and Labour Welfare Fund.  
Payment of Bonus.  
Costing and Management Reports.



4. Sales Order Processing :
  - Order acceptance and Recording
  - Sales Invoicing.
  - Sales Analysis based on Products, Customers and Terms.
5. Inventory Management :
  - Purchase order processing.
  - Stores accounting.
  - Storestransactions-Receipts, Issues and Adjustments.
  - Bin Cards and Stock Ledger.
  - Inventory Levels-EOQ-ABC analysis,
  - Inventory Control Reports such as Slow Moving/Non-Moving Items.
6. Meterial Planning :
  - Bill of Material
  - Computing Gross/Net requirements.
7. Banking :
  - Functions and Reports related to Savings Bank Accounting.
8. Hotel Management :
  - Department Organisation of Hotel such as Room Occupancy, Room Service, Restaurants, House-keeping, Conferencing, Exhibitions, Parties, etc.
  - Kitchen Stores Accounting .
  - reservation, Check-in and Check-out.
  - Service Accounting and Bill Printing.
  - Management Reports.
9. Hospital Management :
  - Departmental Organisation of Sospital such as In-Patient, Out-patient, Laboratories, Pharmacy, Surgical Rooms etc.
  - Medical Stores Accounting.
  - Registration, Shifting and Discharge of patients.
  - Service Accounting and Bill Printing.
  - Management Reports.

#### 106. PRACTICALS

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 Based on Visual C++ and Oracle Visual Basic & there should be minimum 20 practicals based on Visual C++ (10 Practical)and Oracle and Visual Basic 5 each Practical

The practical examination shall be conducted by two external examiners appointed by the University which shall carry 60 marks and the internal assesment of practical examination shall be conducted by the Institute which shall carry 40 marks.

#### 107. PROJECT WORK AND VIVA :

Internal Assesment shall be carry 40 marks and External Assesment shall cary 60 marks