Swami Ramanand Teerth Marathwada University, Nanded

Syllabus

B. Sc. Third Year

COMPUTER SCIENCE

Semester System (Long Ans. Pattern)

(To Be Implemented From Academic Year 2013-2014)

Theory/ Practical	Semester/ Annual	Semester No.	Paper No.	Title of the Paper	Marks						Min. Lectures/ Week
					Long Ans.	Internal	Experiment	Oral	Record Book	Total	
Theory	Semester	V	XII	Software Engineering	40	10	---	---	---	50	03
			XIII (A) or XIII (B)	Relational Database Management System **OR** E-Commerce	40	10	---	---	---	50	03
		VI	XIV	Programming in Visual Basic	40	10	---	---	---	50	03
			XV (A) or XV (B)	Computer Network **OR** Unix Shell Programming	40	10	---	---	---	50	03
Practical	Annual	-	XVI	**Computer Lab-4**	---	---	30	10	10	50	03
			XVII	**Computer Lab-5**	---	---	30	10	10	50	03
Total					**160**	**40**	**60**	**20**	**20**	**300**	---

Total Marks for Theory = 50+50+50+50 = **200**	Total Lectures / Week /Division for Theory = **06**
Total Marks for Practical = 50+50 = **100**	Total Lectures/ Week / Batch for Practical = **06**
Total Marks for TY = 200+100 = **300**	Minimum Lectures / Week for TY = **12**
Computer Lab-4 (Annual Practical based on Paper No XIII & XIV)	**Computer Lab-5** (Project work)

Semester-V

XII-Software Engineering

UNIT - I:

Introduction to Software Engineering: Definitions - Size Factors - Quality and Productivity Factors - Managerial Issues - Planing a software project : Defining the problem - Developing a Solution Strategy - Planning the Development Process - Planning an Organization structure - Other Planning Activities.

UNIT - II:

Software Cost Estimation: Software cost factors - Software Cost Estimation Techniqes - Staffing-level Estimation - Estimating Software Maintenance Costs - The Software Requirements Specification - Formal Specification Techniques - Languages and Processors for Requirements Specification.

UNIT - III:

Software design: Fundamental Design Concepts - Modules and Modularization Criteria - Design Notations - Design Techniques - Detailed Design Considerations - Real-Time and Distributed System Design - Test Plans - Milestones, walkthroughs, and Inspections.

UNIT - IV:

Implementation issues: Structured Coding Techniques - Coding Style - Standards and Guidelines - documentation guidelines -Type Checking - Scoping Rules - Concurrency Mechanisms.

UNIT - V:

Quality Assurance - Walkthroughs and Inspections - Static Analysis - Symbolic Execution

Unit-VI:

Testing and Debugging - System Testing - Formal Verification: Enhancing Maintainability during Development - Managerial Aspects of Software Maintenance - Source Code Metrics - Other Maintenance Tools and Techniques.

Text Books for Study:

1. R.Fairley, Software Engineering Concepts, Tata McGraw-Hill Edn. 1997.
2. R.SPressman, Software Engineering, Fourth Ed., McGraw Hill, 1997.

XIII(A) Relational Database Management System

UNIT - I:

Advantages and Components of a Database Management Systems - Feasibility Study - Class Diagrams - Data Types - Events - Normal Forms - Integrity - Converting Class Diagrams to Normalized Tables - Data Dictionary.

UNIT - II:

Query Basics - Computation Using Queries - Subtotals and GROUP BY Command - Queries with Multiple Tables Subqueries - Joins - DDL & DML - Testing Queries.

UNIT - III:

Effective Design of Forms and Reports - Form Layout - Creating Forms - Graphical Objects - Reports -- Procedural Languages - Data on Forms - Programs to Retrieve and Save Data - Error Handling.

UNIT - IV:

Power of Application Structure - User Inteiface Features - Transaction -- Forms Events - Custom Reports - Distributing Application - Table Operations - Data Storage Methods - Storing Data Columns - Data Clustering and Partitioning.

UNIT - V:

Database Administration - Development Stages - Application Types - Backup and Recovery - Security and Privacy –

UNIT-VI:

Distributed Databases - Client/Server Databases - Web as a Client/Server System - Objects - Object Oriented Databases - Integrated Applications.

Text Books for Study:

1. G. V. Post - Database Management Systems Designing and Building Business Application - McGraw Hill International edition - 1999.

References:

1. Raghu Ramakrishnan - Database Management Systems - WCB/McGraw Hill - 1998.
2. C.J. Date - An Introduction to Database Systems - 7th Edition - Addison Wesley - 2000.

XIII (B)-E-Commerce

UNIT –I:
Electronic Commerce Framework, Traditional vs. Electronic business applications, the anatomy of E-commerce applications.

UNIT-II:
Network infrastructure for E-Commerce -components of the I-way- Global information distribution networks public policy issues shaping the I-way. The internet as a network infrastructure. The Business of the internet commercialization.

UNIT-III:
Network security and firewalls -client server network security -firewalls and network security -data and message security -encrypted documents and electronic mail.

UNIT-IV:
Electronic Commerce and world wide web, consumer oriented E-commerce, Electronic payment systems,

UNIT-V:
Electronic data interchange (EDI),EDI applications in business ,EDI and
E-commerce EDI implementation.

UNIT-VI:
Intraorganizational Electronic Commerce supply chain management. Electronic Commerce catalogs, Document Management and digital libraries.

Text Books for Study:

R. Kalakota and A. B. Whinston, Frontiers of Electronic Commerce, Addison Wesley, 1996.

Reference Books:
1. R.Kalakota and A.B.Whinston,Readings in Electronic Commerce, Addison Wesley, 997.
2. David Kosiur, Understanding Electronic Commerce, Microsoft Press, 1997.
3. Soka, From EDI to Electronic Commerce , McGraw Hill, 1995.

4. Saily Chan, Electronic Commerce Management, John Wiley, 1998

Semester-VI

XIV -Programming in Visual Basic

UNIT-I:

Introduction to Windows , GUI concept, Concept of Event driven programming, The Visual Basic IDE ,Types of Visual Basic Projects, Visual Basic Editions, The Visual Basic Project Lifecycle, Project Files.

UNIT-II:

Customizing a Form - Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button - Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types - String - Numbers.

UNIT-III:

Displaying Information - Determinate Loops - Indeterminate Loops - Conditionals - Built-in Functions - Functions and Procedures.

UNIT-IV:

Lists - Arrays - Sorting and Searching - Records - Control Arrays - Combo Boxes - Grid Control - Projects with Multiple forms - Do Events and Sub Main - Error Trapping.

UNIT-V:

VB Objects - Dialog Boxes - Common Controls - Menus - MDI Forms - Testing, Debugging and Optimization - Working with Graphics.

UNIT-VI:

Monitoring Mouse activity - File Handling - File System Controls - File System Objects - COM/OLE - automation - DLL Servers - OLE Drag and Drop.

References:

1. Gary Cornell - Visual Basic 6 from the Ground up - Tata McGraw Hill - 1999.
2. Noel Jerke - Visual Basic 6 (The Complete Reference) - Tata McGraw Hill - 1999.

XV (A) Computer Network

UNIT-I:

Overview Networking terminology, network types- Transmission Media,Control Schemes Layered Architecture ,OSI Reference Model ,

UNIT-II:

TCP/IP Reference Model ,Telephone Networks
Leased Lines ,PSTN,ISDN ,Broadband Communications ISPs.

UNIT-III:
Geographical Classifications of Network ,Ethernet ,LAN Interconnection ,Topologies- Fast Ethernets , VLANs ,Protocols ,Frame Relay, MAN ,IP Addresses , Routing Algorithms ,Internet Routing

UNIT-IV:
TCP/IP , UDP, Wireless TCP , DNS, Electronic Mail , FTP , TFTP , SNMP etc.

UNIT-V:
Wireless Networks , Blue Tooth ,Cellular Radio Networks ,Wireless LANs ,Cable Television Networks ,Satellite Television Networks ,Interactive Services.

UNIT-VI:
Internet ,Web Servers , Applications , URLs- WWW- HTTP & MIME ,HTML & XML Protocols Languages ,Scripts, RTSP , WAP , Securities Basic Techniques -Data Encryption, Authentication ,Network and Web Security ,Privacy.

Text Books for Study:

1.Michael A. Gallo, William M. Hancock, “Computer Communications and Networking Technologies”, CENGAGE Learning.
2.Andrew S. Tanenbaum, “Computer Networks”, Pearson Education.

REFERENCE BOOKS:
1.James F. Kurose, Keith W. Ross, “Computer Networking”, Pearson Education.
2.Behrouz A Forouzan, “Data Communications and Networking”, McGraw Hill.

XV (B) Unix Shell Programming

UNIT-I:

File and common commands - Shell - More about files - Directories- Unix system - Basics of file Directories and filenames - Permissions - modes - Directory hierarchy - Devices - the grep family - Other filters - the stream editor sed - the awk pattern scanning and processing language - files and good filters.

UNIT-II:

Command line structure - Metacharacters - Creating new commands - Command arguments and parameters - program output as arguments - Shell variables - More on I/O redirection - loop in shell programs - Bundle - Setting shell attributes, Shift command line parameters - Exiting a command or the shell, evaluating arguments - Executing command without invoking a new process - Trapping exit codes -- Conditional expressions.

UNIT-III:

Customizing the cal command, Functions of command, While and Until loops - Traps - Catching interrupts - Replacing a file - Overwrite - Zap - Pick command - News command - Get and Put tracking file changes.

UNIT-IV:

Standard input and output - Program arguments - file access - A screen at a time printer - On bugs and debugging - Examples - Zap - pick - Interactive file comparison program - Accessing the environment - Unix system calls - Low level I/O, File system Directories and modes, Processors, Signal and Interrupts.

UNIT-V:

Program development - Four function calculator - Variables and error recovery - Arbitrary variable names, Built in functions, Compilation into a machine, Control flow and relational operators,

UNIT-VI:

Functions and procedures - Performance evaluation - Ms macro package - Troff level - Tbl and eqn preprocessors - Manual page - Other document preparation.

Text Book for Study:

1. Brian W. Kernighan, Rob Pike - The UNIX Programming Environment - Prentice Hall of India(1984).

References:

I. Steven Earhart - The UNIX System for MSDOS Users - Galgotia book source P. Ltd. (1990).
2. Stefen Prata - Advanced UNIX - A Programmer Guide.

Computer Lab-4

XVI- UNIX AND SHELL PROGRAMMING LAB.

Students can refer the following book for further details. Charles Crowley - Operating Systems (A Design Oriented Approach) - TMH - 1998.

The following are guidelines for the computer lab, the subject teacher or lab instructor can prepare different kinds of problem statements for the lab evaluation

1. Prime Test.
2. Palindrome Test.
3. Fibonacci Series generation.
4. Armstrong No Test.
5. Solving Quadratic Equation.
6. Menu Driven Shell Script - Sort with various options.
7. User friendly change of modes (chmod).
8. Usage of case structures.
9. Process Scheduling.
FCFS,SJF,Priority-Round Robin
10. Interprocess communications using message Queues & Pipes.
11. Using Pipes to calculate NCR.
12. Applications for functions, Procedures & Macros.

Computer Lab-5

Paper No: XVII
Computer Lab-5

(Project Work)

About Project Work

☐ Maximum a group of 03 students are allowed to work on a project.

☐ Project Synopsis should be submitted by the students to their concern faculty also a declaration should be submitted by the students regarding the originality of work.

☐ Project report should prepared by the students & it should be certified by concern faculty & head of the department.

☐ Students should submit one hardcopy of report to the department.

☐ **Distribution of marks for project is as**

○ Project Work	:	30
○ Project Viva	:	10
○ Project Report	:	10
Total Marks	**:**	**50**

GUIDELINES FOR THE PREPARATION OF PROJECT REPORTS

- Project reports should be typed neatly only on one side of the paper with 1.5 or double line spacing on a A4 size bond paper (210 x 297 mm). The margins should be: Left - 1.25", Right - 1", Top and Bottom - 0.75".

- The total number of reports to be prepared are

    - One copy to the department
    - One copy to the concerned guide(s)
    - Two copies to the sponsoring agency
    - One copy to the candidate.

3. Before taking the final printout, the approval of the concerned guide(s) is mandatory and suggested corrections, if any, must be incorporated.

4. For making copies dry tone Xerox is suggested.

5.Every copy of the report must contain Inner title page (White)

- Outer title page with a plastic cover
- Certificate in the format enclosed both from the college and the organization where the project is carried out.
- An abstract (synopsis) not exceeding 100 words, indicating salient features of the work. (NB: four copies of the abstract are to be submitted to the Department on the date of submission separately)

6.The organization of the report should be as follows

1. Inner title page 2. Abstract or Synopsis 3. Acknowledgments 4. Table of Contents 5. List of table & figures (optional)	Usually numbered in roman

- Chapters (to be numbered in Arabic) containing Introduction-, which usually specifies the scope of work and its importance and relation to previous work and the present developments, Main body of the report divided appropriately into chapters, sections and subsections.
- The chapters, sections and subsections may be numbered in the decimal form for e.g. Chapter 2, sections as 2.1, 2.2 etc., and subsections as 2.2.3, 2.5.1 etc.

- The **chapter must be left or right justified** (**font size** 16). Followed by the **title of chapter centered** (**font size 18**), **section/subsection numbers along with their headings must be left justified** with **section number and its heading in font size** 16 and **subsection and its heading in font size** 14. The **body or the text** of the report should have font size 12.
- The figures and tables must be numbered chapter wise for e.g.: Fig. 2.1 Block diagram of a serial binary adder, Table 3.1 Primitive flow table, etc.
- The last chapter should contain the summary of the work carried, contributions if any, their utility along with the scope for further work.

Reference OR Bibliography: The references should be **numbered serially** in the order of their occurrence in the text and their numbers should be indicated within square brackets for e.g. [3]. The section on references should list them in serial order in the following format.

1. For textbooks - A.V. Oppenheim and R.W. Schafer, Digital Signal Processing, Englewood, N.J., Prentice Hall, 3 Edition, 1975.
2. For papers - Devid, Insulation design to combat pollution problem, Proc of IEEE, PAS, Vol 71, Aug 1981, pp 1901-1907.

- Only SI units are to be used in the report. Important equations must be numbered in decimal form for e.g.
- **V = IZ** ..... **(3.2)**
- All equation numbers should be right justified.
- The project report should be brief and include descriptions of work carried out by others only to the minimum extent necessary. Verbatim reproduction of material available elsewhere should be strictly avoided. Where short excerpts from published work are desired to be included, they should be within quotation marks appropriately referenced.
- Proper attention is to be paid not only to the technical contents but also to the organization of the report and clarity of the expression. Due care should be taken to avoid spelling and typing errors. The student should note that report-write-up forms the important component in the overall evaluation of the project
- Hardware projects must include: the component layout, complete circuit with the component list containing the name of the component, numbers used, etc. and the main component data sheets as Appendix. At the time of report submissions, the students must hand over a copy of these details to the project coordinator and see that they are entered in proper registers maintained in the department.
- Software projects must include a virus free disc, containing the software developed by them along with the read me file. Read me file should contain the details of the variables used, salient features of the software and procedure of using them: compiling procedure, details of the computer hardware/software requirements to run the same, etc. If the developed software uses any public domain software downloaded from some site, then

the address of the site along with the module name etc. must be included on a separate sheet. It must be properly acknowledged in the acknowledgments.

- Sponsored Projects must also satisfy the above requirements along with statement of accounts, bills for the same dully attested by the concerned guides to process further, They must also produce NOC from the concerned guide before taking the internal viva examination.
- The reports submitted to the department/guide(s) must be hard bounded, with a plastic covering.
- Separator sheets, used if any, between chapters, should be of thin paper

NAME OF THE INSTITUTION
Address with pin code

Department of ……..

CERTIFICATE

Certified that the project work entitled ……... carried out by Mr./Ms. ……..……..., USN……..……, a bonafide student of …….in partial fulfillment for the award of **Bachelor of Science** in ……..…….…… of the Swami Ramanand Teerth Marathwada University, Nanded during the year ……... It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Name & Signature of the Guide Name Signature of the HOD Signature of the Principal

External Viva

Name of the examiners
Signature with date

1
2.

Certificate issued at the Organization where the project was carried out

(On a separate sheet, If applicable)

NAME OF THE INDUSTRY / ORGANIZATION
Address with pin code

CERTIFICATE

Certified that the project work entitled ……... carried out by Mr./Ms . …….., USN……..……, a bonafied student of ……in partial fulfillment for the award of **Bachelor of Science** in ……...…….…… of the Swami Ramanand Teerth Marathwada University, Nanded during the year ……... It is certified that, he/she has completed the project satisfactorily

Name & Signature of the Guide

Name & Signature of the Head of organization