| STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TEACHING AND EVALUATION SCHEME FOR **6th SEMESTER** DIPLOMA IN **INFORMATION TECHNOLOGY**(wef 2015-16) | | | | | | | | | | | |
| Sl. No. | Subject Code | Subject | Periods/week | | | Evaluation Scheme | | | | | |
| | | | L | T | P | Sessional Exams | | | End Sem Exams | Practical exams | Term Work |
| | | | | | | TA | CT | Total | | | |
| | | **Theory** | | | | | | | | | |
| 1 | CST-601 | E-Commerce | 4 | - | - | 10 | 20 | 30 | 70 | - | - |
| 2 | CST-602 | Internet & Web Technology | 4 | - | - | 10 | 20 | 30 | 70 | - | - |
| 3 | CST-603 | Cryptography & Network Security | 4 | 1 | - | 10 | 20 | 30 | 70 | - | - |
| 4 | ITT-601 | Mobile Computing | 4 | - | - | 10 | 20 | 30 | 70 | - | - |
| 5 | ITT-602 | Elective (any one) | 4 | - | - | 10 | 20 | 30 | 70 | - | - |
| | | **Total** | *20* | *1* | | *50* | *100* | *150* | *350* | - | - |
| | | **Practical/ Term Work** | | | | | | | | | |
| 6 | ITP-601 | Project Work & Seminar | - | - | 6 | - | - | - | - | 50 | 50 |
| 7 | ITP-602 | Front End Tools Lab | - | - | 4 | - | - | - | - | 50 | 25 |
| 8 | ITP-603 | Web Development Lab | - | - | 6 | - | - | - | - | 50 | 25 |
| | | Library studies | - | - | 2 | - | - | - | - | - | |
| | | *Total* | - | - | *18* | - | - | - | - | *150* | *100* |
| | | **Grand Total** | **20** | **01** | **18** | **50** | **100** | **150** | **350** | **150** | **100** |
| **Abbreviations:** L-Lecturer, T-Tutorial, P-Practical, TA-Teachers Assessment, CT-Class Test | | | | | | | | | | | |
| Minimum Pass Mark in each Theory subject is 35% and in each Practical subject is 50% | | | | | | | | | | | |

**Elective Subjects :**

- Advanced Microprocessor & Peripherals
- Software Project Management
- Software Testing
- Enterprise Resource Planning

## 6th Semester

# E-Commerce

| | | | |
|---|---|---|---|
| Semester & Branch: | 6th sem CSE/IT/ETC | Teachers Assessment : | 10 Marks |
| Theory: | 4 Periods per Week | Class Test : | 20 Marks |
| Total Periods: | 60 Periods per Semester | End Semester Exam : | 70marks |
| Examination: | 3 Hours | TOTAL MARKS : | 100 Marks |

**RATIONALE**

E- commerce is the basic foundation paper for any hardcore computer engineer. In this subject students will be exposed to the theoretical aspects of different functional parts of E-commerce.

**COURSE CONTENT** **PERIODS**

**1. Intoroduction to E-Commerce** **08**

1.1 Introduction
1.2 what is E-commerce
1.3 E-Business
1.4 Categories of E-Commerce Applications
1.5 Global Trading Environment & Adoption of E-commerce
1.6 Comparison between traditional and E-commerce
1.7 Advantage and Disadvantage

**2. Business Models of E-Commerce** **05**

2.1 Introduction
2.2 Business Models of E-Commerce
2.3 B2C
2.4 B2B
2.5 Difference between B2C and B2B
2.6 C2C

**3. B2B e-Commerce and EDI** **10**

3.1 Introduction
3.2 Need for B2B
3.3 EDI
3.4 Paperless Transaction
3.5 EDI standards
3.6 Data Standards used in EDI
3.7 Cost of EDI
3.8 Reasons for Slow acceptability
3.9 Electronic Fund Transfer (Canada case eliminated)
3.10 XML and its application
3.11 Comparison of HTML and XML
3.12 Advantage of XML as a Technology

**4. Business Applications of E-Commerce** **07**

4.1 Introduction
4.2 Trade Cycle
4.3 Supply Chain
4.4 E-Procurement
4.5 Implementing E-Procurement
4.6 Competitive Advantage
4.7 E-Commerce Application in Manufacturing
4.8 E-Commerce Application in Wholesale

4.9 E-Commerce Application in Retail
4.10 E-Commerce Application in Service Sector

**5. E-Commerce in Technology** **08**
5.1 Introduction
5.2 IT infrastructure
5.3 Internet
5.4 Middleware
5.5 Intranet
5.6 Extranet
5.7 VPN
5.8 Firewall
5.9 Cryptography
5.10 Digital Signature
5.11 Digital Envelope
5.12 Digital certificates
5.13 Contents

**6. Electronic Payment System** **08**
6.1 Introduction
6.2 Electronic Payment Mechanism
6.3 Types of Payment System
6.4 Risks Associated with Electronic Payment
6.5 Risk Management option
6.6 Payment Gateway
6.7 Issues of Electronic Payment Technology
6.8 Recommendations
6.9 Internet Banking
6.10 Security Requirement
6.11 Secure Socket Layer
6.12 Biometrics

**7. Security Issues in E-Commerce** **08**
7.1 Introduction
7.2 E-commerce security issues
7.3 Risks involved in e-commerce
7.4 Protecting e-commerce system
7.5 Common E-commerce Security Tools
7.6 Client server Network security
7.7 Data and Message Security

**8. Current Trends in Electronic World** **06**
8.1 E-waste
8.2 E-Surveillance
8.3 E-governance
8.4 E-care

**Books**

1. E-commerce and Mobile Commerce Technology By : U.S Pandey and S Sukla (S.Chand)
2. e-commerce ; By : Bhushan Dewan (S.Chand & Company Ltd.)
3. e-Commerce; Bhasker; TMH
4. Concepts of e-commerce ; A.K.Pandey; Katson

## Internet and Web Technology

| | | | |
|---|---|---|---|
| Semester & Branch: | 6th sem CSE/IT | Teachers Assessment : | 10 Marks |
| Theory: | 4 Periods per Week | Class Test : | 20 Marks |
| Total Periods: | 60 Periods per Semester | End Semester Exam : | 70marks |
| Examination: | 3 Hours | TOTAL MARKS : | 100 Marks |

**RATIONALE**

Internet is the buzz word in today's society. It is a vast pool of information. Without the knowledge of Internet we are in total darkness. This papers deals with *TCP/IP* which is the backbone of Internet. Web pages are used to project the profile on an organization, product or person etc. This paper also deals with the design aspects of Web Page.

**1.0 Internet Fundamentals** **10**

1.1 Motivation for internet working
1.2 Internet Architecture Board
1.3 Internet protocol and standardization
1.4 Role of ISP & Factors for choosing an ISP
1.5 Internet service providers in India
1.6 Types of connectivity such as Dial Up, leased, VSAT etc.
1.7 Properties of Internet
1.8 Internet Architecture
1.9 Interconnection through IP Routers
1.10 All Networks are Equal
1.11 Internet address
1.12 Original classful addressing scheme
1.13 Address specify Network connections
1.14 Dotted Decimal Notation
1.15 Internet addressing authority

**2.0 TCP / IP** **10**

2.1 TCP / IP internet layering model
2.2 Reliable stream transport service (TCP) , Need for stream delivery
2.3 Properties of reliable delivery service
2.4Providing reliability
2.5 Idea behind slide windows
2.6 Ports connections and end points , Segment, stream, sequence number
2.7 TCP segment format
2.8 TCP header
2.9 TCP checksum
2.10 Acknowledgement
2.11 Time out and retransmission
2.12 Response to congestion
2.13 Establishment of a TCP connection
2.14 Source and destination address
2.15 Protocol number
2.16 Checksum
2.17 Closing TCP connection
2.18 TCP connection reset.

**3.0 INTERNET PROTOCOL** **10**

3.1 Connection less data gram delivery (Internet protocol)
3.2 Concept of unreliable delivery
3.3 Connection less delivery system
3.4 Purpose of internet protocol
3.5 IP header

3.6 Source and destination address
3.7 Protocol number
3.8 Checksum
3.9 Routing in an internet
3.10 Direct and indirect delivery
3.11 Table driven IP rooting
3.12 Default roots
3.13 Host specific roots
3.14 Rooting with IP address

**4.0 Subnet Address Extension** **04**
4.1 Introduction to subnet address extension
4.2 Minimizing network numbers
4.3 Transparent routers
4.4 Subnet addressing
4.5 Flexibility in subnet address assignment
4.6 Implementation of subnet with mask
4.7 Subnet mask representation
4.8 Routing in the presence of subnet

**5.0 UDP** **02**
5.1 Introduction to UDP
5.2 Identifying the ultimate destination
5.3 Format of UDP message

**6.0 DOMAIN NAME SYSTEM** **04**
1.1 Hierarchical Names
6.2 Subnet Authority
1.2 Internet Domain Names
1.3 Official domain Names
1.4 Mapping of domain name to address
1.5 Domain name resolution
1.6 Efficient translation
1.7 Abbreviation of domain name

**7.0 Internet Applications & Services** **10**

7.1 E-Mail networks
7.2 E-Mail protocols
7.3 Format of an e-mail message
7.4 E-mail routing
7.5 E-mail clients, POP3,IMAP
7.6 Public domain software
7.7 Types of FTP servers
7.8 FTP clients
7.9 Telnet protocol
7.10 Server domain
7.11 clients
7.12 IRC network & servers
7.12 Channels
7.13 World Wide Web
7.14 Browser

**8.0 HTML & Interactive Tools** **10**

8.1 Document overview Explain Header elements
8.2 Section headings
8.3 Block oriented elements Discuss Lists
8.4 Inline elements

8.5 Visual markup
8.6Hypertext links
8.7 Uniform Resource Locator Discuss Imagers
8.8 Tables
8.9 Special characters
8.10 CGI (Common Gateway Interface) Explain Active X
8.11 VB Script
8.12 Java Script
8.13 XML application
8.14 XML rules
8.15 Displaying XML documents
8.16 Parts of XML document
8.17 Concepts of DTD
8.18 Entity definition & classification Concepts of templates & its use
Filtering & sorting

**Books:**

1. Internet working with TCP/IP Vol-I: Principles, Protocols & architecture
By Douglas E. Comer - PHI
2. HTML: The definitive guide - By Chuck Musciano & Kennedy
3. Internet working with TCP/IP Vol-II: Design, implementation & internals
By Douglas E. Comer -& David L. Stevens – PHI
4. Internet & Web page Design, By : Sisodia; BPB Publication
5.Web Technologies by U.K Roy, Oxford Univ.Press

## Cryptography & Network Security

| | | | |
|---|---|---|---|
| Semester & Branch: | 6th sem CSE/IT | Teachers Assessment : | 10 Marks |
| Theory: | 4 Periods per Week | Class Test : | 20 Marks |
| Total Periods: | 60 Periods per Semester | End Semester Exam : | 70marks |
| Examination: | 3 Hours | TOTAL MARKS : | 100 Marks |

**RATIONALE**

Now a day almost all It related jobs use the internet as the backbone service. Therefore it is highly essential for an IT professional to have a fare idea on the security aspect of internet service. This paper aims to provide the student with the various security threats in internet and discuss the different techniques to implement this. One of such technique is implementation of cryptography in the confidential data to be floated in the internet.

**1. Possible attacks on Computers** **05**

1.1 The need for security
1.2 Security approach
1.3 Principles of security
1.4 Types of attacks

**2. Cryptography Concepts** **10**

2.1 Plain text & Cipher Text
2.2 Substitution techniques
2.3 Transposition techniques
2.4 Encryption & Decryption
2.5 Symmetric & Asymmetric key cryptography

**3. Symmetric & Asymmetric key algorithms** **15**

3.1 Symmetric key algorithm types
3.2 Overview of Symmetric key cryptography
3.3 Data encryption standards
3.4 Over view of Asymmetric key cryptography
3.5 The RSA algorithm
3.6 Symmetric & Asymmetric key cryptography
3.7 Digital signature

**4. Digital certificate & Public key infrastructure** **10**

4.1 Digital certificates
4.2 Private key management
4.3 PKIX Model
4.4 Public key cryptography standards

**5. Internet security protocols** **10**

5.1 Basic concept
5.2 Secure socket layer
5.3 Transport layer security
5.4 Secure Hyper text transfer protocol(SHTTP)
5.5 Time stamping protocol (TSP)
5.6 Secure electronic transaction (SET)

**6. User authentication** **04**

6.1 Authentication basics
6.2 Password
6.3 Authentication Tokens
6.4 Certificate based authentication
6.5 Biometric authentication

**7. Network Security & VPN** **06**

7.1 Brief introduction of TCP/IP
7.2 Firewall
7.3 IP Security
7.4 Virtual Private Network (VPN)

**Books :**


1. Cryptography & Network security ; By: A. Kahate : TMH
2. Cryptography & Information security; Pachghare ;PHI
3. Cryptography & Network Security – Principals and Practices; By: W.Stallings, Prentice Hall.

## Mobile Computing

| | | | |
|---|---|---|---|
| Semester & Branch: | 6th sem IT | Teachers Assessment : | 10 Marks |
| Theory: | 4 Periods per Week | Class Test : | 20 Marks |
| Total Periods: | 60 Periods per Semester | End Semester Exam : | 70marks |
| Examination: | 3 Hours | TOTAL MARKS : | 100 Marks |

### RATIONALE

Mobile Computing is the basic foundation paper for any hardcore computer engineer. In this subject students will be exposed to the theoretical aspects of different functional units of a digital computer and fundamental idea how different units of a computer system work together to achieve a common goal.

### COURSE CONTENT — PERIODS

**1. Introduction to Wireless networks & Mobile Computing — 06**
1.1 Networks
1.2 Wireless Networks
1.3 Mobile Computing
1.4 Mobile Computing Characteristics
1.5 Application of Mobile Computing

**2. Introduction to Mobile Development Frameworks — 06**
2.1 C/S architecture
2.2 n-tier architecture
2.3 n-tier architecture and www
2.4 Peer-to Peer architecture
2.5 Mobile agent architecture

**3. Wireless Transmission — 06**
3.1 Introduction
3.2 Signals
3.3 Period, Frequency and Bandwidth.
3.4 Antennas
3.5 Signal Propagation
3.6 Multiplexing
3.7 Modulation
3.8 Spread Spectrum
3.9 Cellular System

**4. Medium Access Control — 06**
4.1 Introduction
4.2 Hidden/ Exposed Terminals
4.3 The basic Access Method
4.4 Near / Far Terminals
4.5 SDMA, FDMA,TDMA, CDMA

**5. Wireless LANs — 06**
5.1 Wireless LAN and communication
5.2 Infrared
5.3 Radio Frequency
5.4 IR Advantages and Disadvantages
5.5 RF Advantages and Disadvantages
5.6 Wireless Network Architecture Logical
5.7 Types of WLAN
5.8 IEEE 802.11

5.9 MAC layer
5.10 Security
5.11 Synchronization
5.12 Power Management
5.13 Roaming
5.14 Bluetooth Overview

**6. Ubiquitous Wireless Communication 06**
6.1 Introduction
6.2 Scenario of Mobile Communication
6.3 Mobile Communication Generations 1G to 3G
6.4 3rd Generation Mobile Communication Network
6.5 Universal Mobile telecommunication System (UMTS)

**7. Mobile IP 06**
7.1 Overview
7.2 Working with mobile IP
7.3 Mobile IP Entities
7.4 Mobility Agents
7.5 Components of Mobile IP
7.6 Mobile IPv6 Features
7.7 Mobile IPv6 Address Types
7.8 Mobile IPv6 Address Scope
7.9 Mobile IP Operation

**8. Mobile Computing 06**
8.1 WWW architecture for Mobile computing
8.2 Need of WAP
8.3 Benefits of WAP
8.4 Examples of WAP
8.5 WAP- Architecture
8.6 WAP protocols
8.7 WML
8.8 WAP Push architecture
8.9 Push-Pull based data acquisition
8.10 I-mode
8.11 WAP 2.x

**9. Wireless Telecomm Networks 06**
9.1 GSM
9.2 GPRS
9.3 IS-95
9.4 CDMA-2000
9.5 W-CDMA
9.6 Wireless Sensor Networks

**10. Messaging Services 06**
10.1 Short Message Services (SMS)
10.2 Multimedia Message Services (MMS)
10.3 Multimedia transmission over wireless

**Books**

1. Mobile Computing ; By : Dr. N.NJani, Kamaljit I. Lakhtaria, Dr. Ashish N. Jani & Nita Kanabar (S.Chand & Company Ltd.)

## Software Project Management(ELECTIVE)

| | | | |
|---|---|---|---|
| Semester & Branch: | 6th sem IT | Teachers Assessment : | 10 Marks |
| Theory: | 4 Periods per Week | Class Test : | 20 Marks |
| Total Periods: | 60 Periods per Semester | End Semester Exam : | 70marks |
| Examination: | 3 Hours | TOTAL MARKS : | 100 Marks |

### RATIONALE

Software project Management is the basic foundation paper for any hardcore computer engineer. In this subject students will be exposed to the theoretical aspects of different functional units of a digital computer and fundamental idea how different units of a computer system work together to achieve a common goal.

### COURSE CONTENT — PERIODS

**1. Introduction to Software Project Management — 05**

1.1 Introduction
1.2 Why is software project management important
1.3 What is a Project
1.4 Software project versus other types of project
1.5 Contract Management and technical project management
1.6 Activities covered by software project management
1.7 Plans, methods and methodologies
1.8 Some ways of categorizing software project
1.9 What is management
1.10 Problems with software projects
1.11 Setting objects
1.12 Stakeholders

**2. Step wise an overview of Project Planning — 05**

2.1 Introduction to step wise project planning
2.2 Step 0: Select Project
2.3 Step 1: Identify project scope and objectives
2.4 Step 2: Identify project infrastructure
2.5 Step 3: Analyse project characteristics
2.6 Step 4: Identify Project products and activities
2.7 Step 5: Estimate effort for each activity
2.8 Step 6: Identify activity risks
2.9 Step 7: Allocate resources
2.10 Step 8: Review/ publicize plan
2.11 Step 9 and 10 : Execute plan/ lower levels of planning

**3. Programme Management and Project evaluation — 08**

3.1 Introduction
3.2 Programme management
3.3 Managing the allocation of resources within programme.
3.4 Strategic programme management
3.5 Creating a programme
3.6 Aids to Programme management
3.7 Benefits management
3.8 Evaluation of Individual Project
3.9 Technical assessment
3.10 Cost-benefit analysis
3.11 Cash flow forecasting
3.12 Cost-benefit evaluation techniques
3.13 Risk evaluation

**4. Selection of an appropriate project approach** **08**

4.1 Introduction
4.2 Choosing Technologies
4.3 Technical Plan contents list
4.4 Choice of Process Models
4.5 Structure versus speed of delivery
4.6 The waterfall model
4.7 The V-process model
4.8 The spiral model
4.9 Software Prototyping
4.10 Other ways of categorizing prototypes
4.11 Incremental delivery
4.15 Selecting the most appropriate model

**5. Software effort estimation** **08**

5.1 Introduction
5.2 Where are estimate done
5.3 Problems with over-and under-estimates
5.4 The basis for software estimating
5.5 Software effort estimation techniques
5.6 Expert judgment
5.7 Estimating by analogy
5.8 Albrecht function point analysis
5.9 Function point Mark-II
5.10 COSMIC full function points
5.11 A procedural code-oriented approach
5.12 COCOMO: a parametric model

**6. Activity planning** **08**

6.1 Introduction
6.2 The objective of activity planning
6.3 When to plan
6.4 Project Schedules
6.5 Projects and activities
6.6 Sequencing and scheduling activities
6.7 Network planning models
6.8 Formulating a network model
6.9 Adding the time dimension
6.10 The forward pass
6.11 The backward pass
6.12 Identifying the critical path
6.13 Activity float
6.14 Shortening the project duration
6.15 Identifying critical activities

**7. Risk Management** **05**

7.1 Introduction
7.2 Risk
7.3 Categories of Risk
7.4 A frame work for dealing with risk
7.5 Risk Identification
7.6 Risk Assessment
7.7 Risk Planning
7.8 Risk Management

**8. Monitoring and control** **05**

8.1 Introduction

8.2 Creating the frame work
8.3 Collecting the Data
8.4 Visualizing progress
8.5 Cost Monitoring

**9. Managing people and organizing teams 05**
9.1 Introduction
9.8 Working in groups
9.9 Becoming a team
9.10 Decision making
9.11 Leadership
9.12 Organizational structures
9.13 Dispersed and virtual team

**10. Software Quality 03**
10.1 Introduction
10.2 The place of software quality in project planning
10.3 The importance of software quality
10.4 Defining software quality
10.5 ISO 9126
10.6 Practical Software quality measures
10.7 Product versus process quality management
10.8 External standards
10.9 Techniques to help enhance software quality
10.10 Quality plans

(N.B: All case studies are excluded )

**Books**

1.Software Project Management ; By : Bob Hughes and Mike Cotterell (TMH)

## Advanced Microprocessor & peripherals (ELECTIVE)

| | |
|---|---|
| Semester & Branch: 6th sem CSE/IT | Teachers Assessment : 10 Marks |
| Theory: 4 Periods per Week | Class Test : 20 Marks |
| Total Periods: 60 Periods per Semester | End Semester Exam : 70marks |
| Examination: 3 Hours | TOTAL MARKS : 100 Marks |

**RATIONALE**

Microprocessor is the nervous system of any digital computer and is the major component in the field of Computer Engineering. This subject focuses on the latest developments in the field of microprocessor. It gives the Hardware knowledge to the students in the area of different microprocessor's pin configuration, their specification, internal architecture, I/O interfacing through PPI Intel 8255,8259 etc and overall knowledge in the field of Assembly Language programming for advanced microprocessors. Moreover the students will be exposed towards the real time advanced application of the microprocessor in different areas.

**1. THE PROCESSORS: 8086/8088 – ARCHITECTURE, PIN DIAGRAMS AND TIMING DIAGRAM 10**

1.1 Register Organisation of 8086.
1.2 Architecture.
1.3 Signal Description of 8086.
1.4 Physical Memory Organisation.
1.5 General Bus Operation.
1.6 I/O Addressing Capability.
1.7 Special Processor Activities.
1.8 Minimum Mode 8086 System & Timing.
1.9 Maximum Mode 8086 System & Timing.
1.10 The Processor 8086.

**2. 80286-80287 A MICROPROCESSOR WITH MEMORY MANAGEMENT AND PROTECTION 10**

2.1 Salient Features of 80286.
2.2 Internal Architecture of 80286.
2.3 Signal Description of 80286.
2.3 Real addressing Mode.
2.4 Protected Virtual Address Mode (PVAM).
2.5 Privilege.
2.6 Protection.
2.7 Special Operation.
2.8 80286 Bus Interface.
2.9 Basic Bus Operation.
2.10 Fetch Cycle of 80286.
2.11 80286 Minimum System Configuration.
2.12 Interfacing Memory and I/O Device with 80286.
2.13 Priority of Bus Use by 80286.
2.14 Bus Hold and HLDA Sequence.
2.15 Interrupt Acknowledge Sequence.
2.16 Instruction Set Features.
2.17 80287 Math Coprocessor.

**3. 80386 - 80387 AND 80486 THE 32-BIT PROCESSOR 10**

a. Salient Features of 80386DX.
b. Architecture and Signal Description of 80386.
3.3 Register Organisaion of 80386.
3.4 Addressing Mode.
3.5 Data Types of 80386.

3.6 Real Address Mode of 80386.
3.7 Protected Mode of 80386.
3.8 Segmentation.
3.9 Paging.
3.10 Virtual 8086 Mode.
3.11 Enhanced Instruction Set of 80386.
3.12 The Coprocessor 80387.
3.13 The CPU with a Numeric Coprocessor – 808486DX.

**4. RECENT ADVANCE IN MICROPROCESSOR ARCHITECURE – A JOURNEY FROM PENTIUM ON WARDS 10**

4.1 Salient Features of 80586 (Pentium).
4.1 A Few Relevant Concepts of Computer Architecture.
4.1 System Architecture.
4.1 Branch Prediction.
4.1 Enhanced Instruction Set of Pentium.
4.1 What is MMX.
4.1 Intel MMX Architecture.
4.1 MMX Data Types.
4.1 Wraparound and Saturation Arithmetic.
4.1 MMX Instruction Set.
4.1 Salient Points About Multimedia Application Programming.
4.1 Journey to Pentium-Pro and Pentium-II.
4.1 Pentium III (P-III) - The CPU of the next Millennium.

**5. PENTIUM 4 – PROCESSOR OF THE NEW MILLENNIUM 10**

5.1 Genesis of Birth of Pentium 4.
**5.1** Salient Features of Pentium **4.**
5.1 Net-burst Micro-architecture of Pentium 4.
5.1 Instruction Translation Look-aside Buffer (ITLB) and Branch Prediction.
5.1 Why Out of Order Execution.
5.1 Rapid Execution Module.
5.1 Memory Subsystem.
5.1 Hyper-threading Technology.
5.1 Hyper-threading in Pentium.
5.1 Extended Instruction Set in Advanced Pentium Processors.
5.1 Instruction Set Summery.
5.1 Need for Formal Verification.

**6. AN INTRODUCTION TO MICROCONTROLLERS 8051 AND 80196 10**

6.1 Intel's Family of 8-bit Microcontrollers.
6.1 Architecture of 8051.
6.1 Signal Description of 8051.
6.1 Register Set of 8051.
6.1 Important Operational Features of 8051.
6.1 Memory and I/O Addressing by 8051.
6.1 Interrupts of 8051.
6.1 Instruction Set of 8051.
6.1 Design of a Microcontroller 8051 Based Length Measurement system for Continuously Rolling Cloth or Paper.
6.1 Intel's 16-bit Microcontroller Family MCS-96.

**Text Book**

1. Advanced Microprocessor and Peripherals ; By: A.K.Ray, K.M.Bhurchandi (TMH)
2. Advanced Microprocessor and Peripherals ; By: B.Ray (TMH)
3. The Intel MP Family hw, sw & Applications; J.L.Antonakos ; Cengage Learning

## Software Testing (Elective)

| | | | |
|---|---|---|---|
| Semester & Branch: | 6th sem IT | Teachers Assessment : | 10 Marks |
| Theory: | 4 Periods per Week | Class Test : | 20 Marks |
| Total Periods: | 60 Periods per Semester | End Semester Exam : | 70marks |
| Examination: | 3 Hours | TOTAL MARKS : | 100 Marks |

**RATIONALE**

Software Testing has emerged as a special branch of software engineering which focuses on different techniques used for testing a software. Success of software lies on this step which is very critical in nature. This paper mostly deals with the diffetent tesing strategies and methods.

**COURSE CONTENT**
**PERIODS**

**1. Introduction to S/w Testing 08**
1.1 Introduction
1.2 Testing Process
1.3 What is s/w Testing
1.4 Purpose of testing
1.5 who should test
1.6 what to test
1.7 selection of good test case
1.8 Measurement of progress
1.9 Incremental testing approach
1.10 Basic terminology
1.11 Testing Life cycle
1.12 when to stop testing
1.13 Principle of testing
1.14 Limitation of testing
1.15 Availability of testing tool, techniques, metrics

**2. S/W verification and Validation 06**
2.1 Introduction
2.2 Verification and Validation
2.3 QA and QC
2.4 V&V Limitations
2.5 Categorising V&V techniques
2.6 Role of V&V in SDLC
2.7 Proof of correctness, Simulation & Prototyping
2.8 Requirement Tracing, s/w v&v planning
2.9 s/w testing review
3.0 Independent v&v contractor
3.1 positive &negative effect of v&v on projects
3.2 Standard for s/w test documentation

**3. Functional Tesing Techniques 10**
3.1 Introduction
3.2 BVA
3.3 Equivalence class testing.
3.4 Dicision Table based testing
3.5 Cause effect graphing technique
3.6 Comparision of techniques

**4. Structural Testing Techniques 10**
4.1 Introduction

4.2 static vs. dynamic testing
4.3 Dynamic WB testing techniques
4.4 Mutation Testing vs. error seeding
4.5 Comparision of BB and WB testing techniques
4.6 Comparison of WB testing techniques
4.7 Advantages

**5. Gray Box Testing** **06**
5.1 Introduction
5.2 What is Gray Box Testing
5.3 Difinitions of Gray Box Testing
5.4 Comparision of WB, BB, GB

**6. Reducing Number of Test Cases** **06**
6.1 Prioritization Guidelines
6.2 Priority Category Schemes
6.3 Risk Analysis
6.4 Regression Testing
6.5 Prioritization of test cases for regression Testing
6.6 Regression Testing Techniques

**7. Levels of Testing** **06**
7.1 Introduction
7.2 Unit, Integration, System, acceptance testing
7.3 Integration Tesing, classification, decomposition
7.4 Call graph, path based integration
7.5 system Testing

**8. Automated Testing** **08**
8.1 Automated testing
8.2 Considerations during testing
8.3 Types of Testing Tools- static vs Dynamic
8.4 problems with manual Testing
8.5 Benefits of Automated Testing
8.7 Disadvantages of Automated testing
8.8 Skill needed for using automated tools
8.9 Test Automation
8.10 Debugging
8.11 criteria for for selection of test tools
8.12 steps for tool selection

**Books**

1. Software Testing; By : Er. Rajiv Chopra (S.K Kataria &sons)

## ENTERPRISE RESOURCE PLANNING (ELECTIVE)

| | | | |
|---|---|---|---|
| Semester & Branch: | 6th sem IT | Teachers Assessment : | 10 Marks |
| Theory: | 4 Periods per Week | Class Test : | 20 Marks |
| Total Periods: | 60 Periods per Semester | End Semester Exam : | 70marks |
| Examination: | 3 Hours | TOTAL MARKS : | 100 Marks |

### RATIONALE

Enterprise Resource Planning is the basic foundation paper for any hardcore computer engineer. In this subject students will be exposed to the theoretical aspects of different functional units of a digital computer and fundamental idea how different units of a computer system work together to achieve a common goal.

### COURSE CONTENT

**PERIODS**

**1. Introduction to Enterprise Resource Planning** **05**

**1.1** Overview of ERP, MRP, MRPII and Evolution of ERP
**1.2** Integrated Management Systems
**1.3** Reasons for the growth of ERP
**1.4** Business Modeling, Integrated Data Model, Foundations of IS in Business
**1.5** Obstacles of applying IT, ERP Market. BOM
**1.6** What is the Connection between ERP and MRP ?

**2. Basic concepts of ERP** **05**

2.1 Why is ERP Important to a company ?
2.2 How does ERP create value?
2.3 How has ERP changed the IS function?
2.4 How does ERP enable inter organisation collaboration?
2.5 How does ERP create value?

**3.0 Risks and Benefits of ERP** **10**

3.1 Justifying ERP Investments,
3.2 Quantifiable benefits from an ERP system ,
3.3 The Intangible Benefits of ERP,
3.4 other factors for justifying ERP investments.
3.5 Risks of ERP, Risk factors of ERP implementation.
3.6 Crucial factors that decides the success or failure of an ERP system.
3.7 People issues, Process Risks , Technological Risks,
3.8 Implementation issues, Operation and maintenance issues,
3.9 Managing Risk on ERP Projects.,
3.9. A Benefits of ERP

**4.0 ERP and related Technologies** **10**

4.1 Business Process Re-engineering (BPR)– BPR Process, Clean Slate Re-engineering,
4.2 Technology Enabled Re-engineering
4.3 Myths regarding BPR
4.4 Business Intelligence Systems-Data Mining, Data Warehousing
4.5 On-Line Analytical Processing (OLAP)

4.6 Supply Chain Management

**5.0 ERP - functional Modules** **10**

5.1 Finance, Accounting Systems
5.2 Manufacturing and Production System
5.3 Sales and Distribution Systems,
5.4 Human Resource Systems
5.5 Plant Maintenance System
5.6 Materials Management System
5.7 Quality Management System
5.8 ERP System Options and Selection
5.9 ERP proposal Evaluation.

**6.0 ERP Implantation and Life Cycle** **10**

6.1 ERP Implementation and Maintenance
6.2 Implementation Strategy Options and their objectives
6.3 Features of Successful ERP Implementation
6.4 Different phases of ERP implantation
6.5 Strategies to Attain Success
6.6 User Training, Maintaining ERP & IS
6.7 Why do many ERP packages fail ?

**7.0 ERP Package Selection** **05**

7.1 ERP Evaluation and selection. ,
7.2 ERP Packages :Make or Buy?

**8.0 ERP Implementation and Process** **05**

8.1 Transition strategies
8.2 Big bang strategy, phased and parallel implementation
8.3 Choosing a strategy
8.4 ERP implementation process
8.5 ERP implementation plan
8.6 ERP implementation – The hidden costs.
8.7 ERP training and education, Data migration, In-house implementation – Pros and cons
8.8 Organisation of the Implementing Team , People involved in the ERP implementation.

**Book**

1. Enterprises Resource Planning, Alex Leon, Tata McGraw-Hill
2. Enterprise Information System : A Pattern based Approach, By : C. Dunn, J.O.Cherington, A.Hollanden, TMH
3. e-Business & ERP : rapid implementation & project planning, By : M.G.Shields, Wiley.

## Project Work & Seminar

| | | | |
|---|---|---|---|
| Semester & Branch: | 6th sem IT | Practical Exam : | 50 Marks |
| Practical: | 6 Periods per Week | Term Work : | 50 Marks |
| Total Periods: | 90 Periods per Semester | TOTAL MARKS : | 100 Marks |
| Examination: | 4 Hours | | |

1. The students should be divided into a group of not more than 5 students. Each faculty should preferably guide one group & he should act as project guide. The students should select the projects of advanced topic of their own choice (Hardware / Software) in consultation with project guide.

2. The sessional records should be maintained and evaluated by a team of faculty members and the final marks awarded by the team.

3. In the end examination, students will be evaluated by External Examiner from outside and Internal Examiner.

## Front End Tools Lab.

| | | | |
|---|---|---|---|
| Semester & Branch: | 6th sem IT | Practical Exam : | 50 Marks |
| Practical: | 4 Periods per Week | Term Work : | 25 Marks |
| Total Periods: | 60 Periods per Semester | TOTAL MARKS : | 75 Marks |
| Examination: | 4 Hours | | |

**1. Introduction**

1.1 Start & Exit Visual Basic, Elementary idea on Objects
1.2 Visual basic Interface
1.3 Debug Windows
1.4 Print Command
1.5 Visual Basic Arithmetic Operator

**2. Variables And Functions**

2.1 Variable Names
2.2 Variable Type
2.3 Range of Variable values
2.4 Functions

**3. Build Project & Customize Form**

3.1 About Project
3.2 Form
3.3 Form events.

**4. Visual Basic Control**

4.1 Custom Control
4.2 Control in Form

**5. Function & Procedures**

5.1 About functions & Procedures
5.2 Form, Standards & Class Modules
5.3 Sub Procedures
5.4 Do-event function
5.5 Control Arrays

**6. Accessing a Database**

6.1 About Database
6.2 Using Data Manager
6.3 Creating a Database
6.4 Creating a new table
6.5 Attaching a table
6.6 Changing Design of existing Table
6.7 Creating Indexes
6.8 Working with Data

**7. Create Form with Data Control**

7.1 Data aware Control
7.2 Create a Form using Data Control
7.3 Manipulating Data
7.4 Create Menu Bar
7.5 Display Menu Item Code

**8. Object Linking and Embedding**

8.1 About OLE
8.2 Terms in OLE
8.3 OLE Automation
8.4 OLE Control pop menus
8.5 Create OLE object at design time

8.6 Create part of an OLE object
8.7 testing Embedding/ linking

**9. Visual Software Development**
9.1 RAD Tools
9.2 Visual Components
9.3 Basic Interface
9.4 Creating and Linking Object through Basic Programming
9.5 Activity

**10. Advanced Features of Visual Basic**
10.1 Visual Basic Controls
10.2 Simple Animation using Active X
10.3 Drag & Drop
10.4 Linking to Database

**11. Active X and Windows API**
11.1 Creating Active X DLL
11.2 Using Windows API in VB

## Web Development Lab

| | | | |
|---|---|---|---|
| Semester & Branch: | 6th sem CSE/IT | Practical Exam : | 50 Marks |
| Practical: | 6 Periods per Week | Term Work : | 25 Marks |
| Total Periods: | 90 Periods per Semester | TOTAL MARKS : | 75 Marks |
| Examination: | 4 Hours | | |

HTML

1. Creation of simple HTML pages, using the following tags.

<Hn> </Hn>
<P> </P>
<Br>
<A HREF> </A>
<Img>
<FONT>

2.Creation of tables and lists using HTML
3. Creation of simple fOIms incorporating GUI components (command button, text box, radio button, check box, combo box) in HTML pages
4. Practical on different Internet services (WWW.Mail. FTP, Chat)
5. Simple application using conditional statements
6. Develop application using loop constraints
7. Creation of classes, interfaces and packages
8. Simple application using threads and runable interface
9. Simple application using thread synchronization methodology
10. Creating application to create user defined exception
11. Simple application to handle inbuilt exceptions
12. Write application to incorporate simple I/O classes
13. Creating application for text file handling
14. Creating application for random file handling
15. Writing applet and embedding it into HTML file
16. Create applet to display different graphical shapes (line, circle, ellipse, arcs, rectangle) and incorporate colour in those shapes
17. Create applet to incorporate GUI components (command button, text box, text area, list box, combo box, check box, frame, check box group)
18. Create applet-using layout manager
19. Write applet to incorporate events
20. Create multi threaded applet3

XML

1. Creation of XML file
2. Viewing XML file using Cascading Style Sheet Viewing XML file using Extended Style Sheet (XSL)
3. Display single record
4. Display all records
5. Sorting & filtering of records
6. Displaying records in the table
7. XML data binding in HTML
8. Displaying single record
9. Navigating between records using buttons Embedding XML data in HTML table Displaying the records in table in different page
10. XML file with attribute

## Laboratory Requirement For Diploma in IT

| Sl. No. | Name of Lab./ Comp. Centre | Semester | Name of the Practical |
|---|---|---|---|
| 1 | Common Computer Centre | 3rd | Data Structure Lab using C |
| | | 3rd | MIS Lab |
| | | 3rd | Advanced C Lab |
| | | 4th | Operating System Lab |
| | | 4th | OOP Lab |
| 2 | Advanced Computer Centre | 5th | DBMS Lab |
| | | 5th | Graphics & Multimedia Lab |
| | | 5th | Programming in Java Lab |
| | | 6th | Front End Tools Lab |
| | | 6th | Web Development Lab |
| | | 6th | Project & Seminar |
| 3 | Microprocessor Lab. | 4th | Microprocessor & Interfacing lab |

### 1. Suggested Equipment for different Laboratories For Diploma in IT

| Sl. No. | Name of the Lab. | Name & Specification of Equipments | Quantity |
|---|---|---|---|
| 1 | Common Computer Centre<br>(The PCs should be on LAN either wireless or wired)<br>(For 60 Students / batch) | **Server PC –**<br>Intel Xeon E 3110 ( Dual Core) 3.00GHz & 6MB Cache 1333MHz FSB & 2GB RAM 146 GB SAS 15k rpm & 3.5" Hot Swap Optical DVD- ROM; pre loaded MS server Software, 3 Years Onsite warranty or **Higher version** | 01 no. |
| | | **Desktop PC –**<br>a. CPU: Intel Core 2 Duo 8400, 3 GHz, 6 MB L2 cache and 1333 MHz FSB.<br>b. Chipset : Intel Q 35 or better on OEM Motherboard.<br>c. Bus Architecture : Integrated Graphics, 2 PCI,1 PCI Express x 1 and 1 PCI Express x 16.<br>d. Memory: 2 GB 667 MHz DDR2 RAM Expandable to 8 GB.<br>e. Hard Disk Drive : 360 GB 7200 rpm Serial ATA HDD.<br>f. Monitor : 43.2 cm (17 inch) TFT Digital Colour Monitor TCO-03 certified.<br>g. Keyboard : 104 keys .<br>h. Mouse : Optical Scroll.<br>i. Bays: 4 Nos.(2 Nos. 5.25 inches for Optical Media Drives and 2 Nos. 3.5 inches for Hard Disk Drives).<br>j. Ports : 6 USB Ports (with at least 2 in front)audio ports for microphone and | 30 nos |

| | | | |
|---|---|---|---|
| | | headphone in front.<br>k. Cabinet : Mini tower.<br>l. DVD ROM Drive : 8X or better DVD R/W Drive.<br>m. Networking facility: 10/100/1000 on board integrated Network Port with remote booting facility remote system installation, remote wake up, out of band management using any standard management software.<br>n. Operating System : Windows XP/Vista Business preloaded with Media and Documentation and Certificate of Authenticity.<br>o. OS Certifications : Win Logo XP/Vista Business OS and Linux certification.<br>p. Power Management: Screen Blanking, Hard Disk and System Idle Mode in Power On, Set up Password, Power supply SMPS Surge protected.<br>q. Preloaded Software: Quick heal Antivirus (Latest Version) with 1 Year License.<br>r. Multimedia: Stereo Headphone with microphone.<br>s. Warranty: Three years onsite warranty.<br>or **Higher version** | |
| | | **0.65 KVA UPS** (offline) with 15 min Backup | 30 Nos. |
| | | **1 KVA UPS** (On Line) with 30 min backup | 01 No. |
| | | **Application Softwares :**<br>MS Office, Turbo C, Visual studio, C++ | 30 User |
| | | **Laser Printer** | 01 no. |
| | | **Image Scanner** | 01 no. |
| 2 | Advanced Computer Centre<br>(The PCs should be on LAN either wireless or wired with internet connection to each PC)<br>(For 30 Students / batch) | **Server PC –**<br>Intel Xeon E 3110 ( Dual Core) 3.00GHz & 6MB Cache 1333MHz FSB & 2GB RAM 146 GB SAS 15k rpm & 3.5" Hot Swap Optical DVD- ROM; pre loaded MS server Software, 3 Years Onsite warranty<br>or **Higher version** | 01 no. |
| | | **Desktop PC –**<br>a. CPU : Intel Core 2 Duo 8400, 3 GHz, 6 MB L2 cache and 1333 MHz FSB.<br>b. Chipset : Intel Q 35 or better on OEM Motherboard.<br>c. Bus Architecture : Integrated Graphics, 2 PCI,1 PCI Express x 1 and 1 PCI Express x 16. | 30 nos |

| | | | |
|---|---|---|---|
| | | d. Memory: 2 GB 667 MHz DDR2 RAM Expandable to 8 GB.<br>e. Hard Disk Drive : 360 GB 7200 rpm Serial ATA HDD.<br>f. Monitor : 43.2 cm (17 inch) TFT Digital Colour Monitor TCO-03 certified.<br>g. Keyboard : 104 keys .<br>h. Mouse : Optical Scroll.<br>i. Bays: 4 Nos.(2 Nos. 5.25 inches for Optical Media Drives and 2 Nos. 3.5 inches for Hard Disk Drives).<br>j. Ports : 6 USB Ports (with at least 2 in front)audio ports for microphone and headphone in front.<br>k. Cabinet : Mini tower.<br>l. DVD ROM Drive : 8X or better DVD R/W Drive.<br>m. Networking facility: 10/100/1000 on board integrated Network Port with remote booting facility remote system installation, remote wake up, out of band management using any standard management software.<br>n. Operating System : Windows XP/Vista Business preloaded with Media and Documentation and Certificate of Authenticity.<br>o. OS Certifications : Win Logo XP/Vista Business OS and Linux certification.<br>p. Power Management: Screen Blanking, Hard Disk and System Idle Mode in Power On, Set up Password, Power supply SMPS Surge protected.<br>q. Preloaded Software: Quick heal Antivirus (Latest Version) with 1 Year License.<br>r. Multimedia: Stereo Headphone with microphone.<br>s. Warranty: Three years onsite warranty.<br>or **Higher version** | |
| | | **0.65 KVA UPS** (offline) with 15 min Backup | 30 Nos. |
| | | **1 KVA UPS** (On Line) with 30 min backup | 01 No. |
| | | **Application Softwares :**<br>MS Office, Turbo C, Visual studio, C++, SQL, Oracle, Java, Sound forge, Photoshop, Premier, Author ware / tool book, flash. | 30 User |
| | | **Laser Printer** | 01 no. |
| | | **Image Scanner** | 01 no. |

| | | | |
|---|---|---|---|
| 3 | Microprocessor Lab.<br>(For 30 Students / batch) | Microprocessor Trainer with interfacing ccts.<br><br>8085 based<br>Based on 8085 CPU operating at 6.144 MHz<br>8 K bytes of EPROM Monitor<br>8 K bytes of RAM with BATTERY Backup (Optional)<br>On-board memory expansion upto 64 KB<br>Three Ch. TIMER/COUNTER using 8253<br>48 I/O lines using 2 nos. of 8255<br>RS232 C interface through SID/SOD lines<br>Two mode of commands:<br>- Hex Key pad Mode, - Serial Mode<br>28 keys hexadecimal keyboard and six seven segment displays through 8279<br>All address, data & control lines are available on 50 pin FRC<br>Facility for Downloading/Uploading files from/to PC<br>Power Supply of +5 V / 1.5 A, ±12 V / 250 mA<br>Interfacing cards for –<br>Stepper Motor control with 2KG Stepper Motor,<br>Traffic light control,<br>DC Motor control,<br>A/D & D/A Conversion,<br>Logic Board Control,<br>KB & Display interface board,<br>8255 interface board | 15 nos |
| | | Offline UPS .65 KVA, 15 min backup | 15 nos. |