

Software Engineering [SWE]

T.Y. Diploma : Sem V
[CO/CM/IF]

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical Exam	–	–
Oral Exam	–	–
Term Work	–	–
Class Test (Two Test)	–	25 (each)

SYLLABUS

1. Overview of Software Engineering & the Software Development Process

- The evolving role of Software & changing nature of software – Definition of a Software, Characteristics of a Software, Categories of Software.
- Software Engineering – A layered Technology approach (Definition of Software Engineering, Need of Software Engineering).
- The software development process – Generic Framework activities, Umbrella activities
 - The Capability Maturity Model Integration Model (CMMI) – levels and their significance, process areas considered for CMMI Level
- PSP and TSP
 - Significance in Ongoing Software Process Improvement
 - Goals
 - Names of the PSP and TSP framework activities and their meaning
- Prescriptive Process Models
 - The Waterfall Model : Nature, Situations in which applicable with example, Associated problems
 - The Incremental Model : Incremental Model (Nature, Situations in which applicable with example, General steps); RAD Model (Nature, Situations in which applicable with example, General steps, Drawbacks)
- The Evolutionary Process Model : Prototyping (Nature, Situations in which applicable with example, General steps, Drawbacks); Spiral Model (Nature, Situations in which applicable with example, General steps, Advantages, Drawbacks)

2. Software Engineering Requirements and Development of Analysis & Design Models

- Software Engineering Practice
 - Definition
 - Importance
 - Essence
- Core Principles of Software Engineering (Statement and Meaning of each Principle)
- Communication Practices (Meaning of Communication, Communication Principles -Statement and Meaning of each)
- Planning Practices (Meaning of Software Planning, Basic Activities included, Planning Principles - Statement and Meaning of each)
- Modeling Practices – Meaning of Software Modeling; Analysis Modeling (Meaning, Names of the analysis domains represented, Analysis Modeling Principles – Statement and Meaning of each); Design Modeling (Meaning, Names of the three Design aspects, Design Modeling Principles – Statement and Meaning of each)

- Construction Practices : Meaning of Software Construction; Coding (Meaning, Preparation Principles, Coding Principles, Validation Principles); Testing (Meaning, Testing Principles – Statement and Meaning of each)
- Software Deployment : Meaning of Delivery Cycle, Support Cycle and Feedback Cycle; Deployment Principles (Statement and Meaning of each)
- Requirements Engineering(RE)
 - Meaning of RE
 - Need of RE
 - RE Tasks (Meaning and Sub-tasks included)
- Analysis Modeling
 - Objectives
 - Analysis Rules of Thumb
 - Domain Analysis : Meaning; Examples of Domain; Goal; Input and Output of Domain Analysis
 - Analysis Modeling Approaches : Structured Analysis (Meaning); Object-oriented Analysis (Meaning)
 - Building the Analysis Model : Data Modeling Concepts (Meaning of the terms – data objects, data relationships, data attributes, cardinality and modality with example); DFD (Use, Standard Notations, Rules followed, DFD construction using any Case study); Data Dictionary (DD) (Meaning, Use, Contents incorporated, Advantages); Creating a Control Flow Model (Nature of Software Applications where required, Use, Guidelines used); Creating Control Specifications (CSPEC) (Use, State diagram and Program activation table - meaning and use); Creating Process Specification (PSPEC) (Use, Names of the contents it includes); Creating a Behavioral Model (Use, General steps)
- Design Engineering/Modeling
 - The Design Process : (Meaning of Software Design, Three Characteristics of good design)
 - Design Quality Guidelines
 - Design Concepts : Abstraction, Architecture, Patterns, Modularity, Information hiding, Functional independence, Refinement, Refactoring, Design classes (Meaning and Importance with respect to ease of design, development, testing, and debugging)
 - The Design Model : Data design elements, Architectural design elements, Interface design elements, Component-level design elements, Deployment-level design elements (meaning and inputs from analysis modeling that help in their creation)

3. Testing Strategies & Methods.

- Software Testing Fundamentals
 - Definition of Software testing
 - Meaning of good test
 - Meaning of successful test
 - Meaning of testing strategy
 - Meaning of test plan, test cases, test data
 - Characteristics of Testing Strategies
- Software Verification and Validation(V&V) Meaning, Differences, Names of the set of SQA Activities involved in V&V
- Testing Strategies for Conventional Softwares
 - Unit Testing : Meaning; Aspects of the Software Program tested
 - Integration Testing : Meaning; Approaches
 - Top-down integration (Meaning, Steps involved)
 - Bottom-up integration (Meaning, Steps involved)
 - Regression testing (Meaning, Purpose)
 - Smoke testing (Meaning, Purpose)
- Alpha and Beta Testing : Meaning, Purpose. Differences
- System Testing
 - Meaning and Purpose

- Types – Recovery testing, security testing, Stress testing, Performance Testing (Meaning, Purpose with example)
- White-box and Black-box Testing (Meaning and Purpose); Debugging
 - Meaning
 - Outcomes
 - Characteristics of Bugs
 - Debugging Strategies : Brute force, Backtracking, Cause elimination, Automated debugging (Meaning)

4. Software Project Management

- What is Software Project Management and Why is it needed?
- The Management Spectrum - The four Ps - the People, the Product , the Process, & the Project (Meaning and Significance of each 'P')
- Project Scheduling and Tracking
 - Meaning of project scheduling and tracking
 - Need
 - What must a project schedule indicate?
 - Reasons why project deadlines cannot be met
 - Basic Principles used for project scheduling (Meaning of each principle)
 - Introduction to the Scheduling Techniques/Methods - PERT, CPM, Timeline Charts
 - Ways in which the project schedule can be tracked (Only a list of the ways)
- Risk Management
 - Meaning of Software Risk
 - Reactive vs Proactive risk strategies : Meaning of Reactive risk strategy; Meaning of Proactive risk strategy; Names of the steps involved in formulation of the Proactive risk strategy
 - Types of Software Risks : Names and Meaning of the risks
 - The RMMM Strategy : The names of the issues involved; Possible steps to mitigate risks; List of the factors to be monitored; The RMM Plan (Meaning and what it includes)
- Change Management : Meaning of SCM; Need of SCM; SCM Features (Names and meaning of the features)
- Cleanroom Software Engineering : The Cleanroom approach; The Cleanroom Strategy (Names and meaning of the tasks involved) The Cleanroom difference

5. Software Quality Management& Estimation

- Basic Quality Concepts
- Software Quality Assurance(SQA) : Definition of SQA; Activities carried out by the SQA Group
- Introduction to Statistical SQA (Meaning and list of the activities involved)
- Six Sigma Strategy for Software : Meaning; Core Steps (The DMAIC Method)
- The ISO 9000 Quality Standards : ISO's definition of Quality; ISO 9001:2000 Software Quality Focus
- Software Reliability and Software Availability : Definition, Units of measurement.
- McCall's Quality Factors (Names and meaning of each factor) Estimation
 - Meaning of Software Estimation
 - List of the steps involved
 - Types of Decomposition Techniques (Names and meaning of the techniques)
 - Software Sizing : Meaning, Approaches (names and meaning of the approaches)
 - COCOMO II Model : Meaning, Use (applications)

Reference :

1. Software Engineering -A Practitioner's Approach (*Roger S. Pressman*) Tata McGraw Hill Publication
2. Software Engineering Concepts (*Richard Fairley*) Tata McGraw Hill Publication
3. Software Engineering -Principles and Practice (*Waman S. Jawadekar*) Tata McGraw Hill Publication
4. Websites : www.sei.emu.edu
www.ieee.org
www.ifpug.org
www.microsoft.com/office/visio
www.rational.com/UML
www.qaiusa.com
www.iso90001compliance.com
www.iso90001.compliance.com

Java Programming [JPR]

T.Y. Diploma : Sem V
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EVALUATION SYSTEM

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Theory Exam	3 Hrs.	100
Practical Exam	–	50#
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Term Work	–	25@
Class Test (Two Test)	–	25 (each)

External Assessment, @ Internal Assessment

SYLLABUS

1. Introduction to Java

- Fundamentals of Object Oriented Programming Object and Classes, Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic Binding
- Java Features : Compiled and Interpreted, Platform independent and portable, Object oriented Distributed, Multithreaded and interactive, High performance
- Constant, Variables and Data Types : Constant, Data Types, Scope of variable, Symbolic Constant, Type casting, Standard default values
- Operator and Expression : Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operator Increment and Decrement Operator, Conditional Operator, Bit wise Operator, Special Operator
- Decision making and Branching : Decision making with if statement, Simple if statement, The if else statement, The else if ladder, The switch statement, The? : Operator
- Decision making and Looping : The While statement, The do statement, The for statement, Jumps in Loops (Break, Continue)

2. Classes, Object and Methods

- Defining a class, Creating object, Accessing class members, Constructor, Methods Overloading, Static Member
- Inheritance Extending a Class (Defining a subclass Constructor, Multilevel inheritance, Hierarchical inheritance, Overriding Methods, Final variable and Methods, Final Classes, Abstract method and Classes
- Visibility Control : Public access, friend access, Protected access, Private access, Private Protected access
- Array, Strings and Vectors : Arrays, One Dimensional array, Creating an array, Two Dimensional array, Strings (String and StringBuffer class), Vectors, Wrapper Classes

3. Interfaces and Packages

- Interface: Multiple Inheritance : Defining interfaces, Extending interfaces, Implementing interfaces, Accessing Interface variable
- Packages: Putting Classes Together : System Package, Using system Package, Naming Convention, Creating Package, Accessing a package, Using a package, adding a class to a package

4. Multithreaded Programming and Exception handling

- Multi Threading : Creating Thread, Extending a thread class, Stopping and Blocking a thread, Life cycle of thread, Using thread method, Thread exceptions, Thread priority, Synchronization, Implementing a "Runnable" Interface

- Managing Errors and Exceptions : Types of errors, Exception, Multiple catch statement, using throw, throws and finally statement, Using Exception for Debugging

5. Java Applets and Graphics Programming

- Applet Programming : Applet basics, Local and remote applets, How applet differ from application, Preparing to write applets, Building applet code, Applet life cycle, Creating an Executable Applet, Designing a Web page, Applet tag, Adding Applet to HTML file, Running the Applet, Passing parameter to applet.
- Graphics Programming : The Graphics Class, Lines and rectangle, Circle and Ellipse, Drawing Arcs, Drawing Polygons, Line Graphs, Using control loops in Applets, Drawing Bar charts.

6. Streams and File I/O

- Stream Classes
- Character Stream, Byte Stream (Reading And Writing Streams)
- Serialization

Reference :

1. Programming with Java (*E. Balagurusamy*) BPB
2. An Introduction to Object Oriented Programming (*C Thomas WU*) Tata McGraw Hill
3. The Complete Reference Java 2 (Third Edition) (*Patrick Naughton-Herbert Schildt*) Tata McGraw Hill
4. Programming with Java (*John R.Hubbard*) Tata McGraw Hill
5. Java Program design (*Cohon & Davidson*) Tata McGraw Hill
6. Java2 Unleashed (*Jawroski*) Techmedia
7. Java2 Programming (*Keyur Shah*) Tata McGraw Hill
8. Web sites : <http://www.sun.java.com>
<http://www.osborne.com>
<http://www.sun.java.com> (For downloading JDK for Practical)

Computer Security [COS]

T.Y. Diploma : Sem V
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SYLLABUS

1. Introduction and Security trends

- Need for security, Security basics : Confidentiality, Integrity, Availability, Authentication, Access Control
- Threats to security : Viruses and Worms, Intruders, Insiders, Criminal organizations, Terrorists, Information warfare Avenues of attack, steps in attack
- Types of attack : Active and Passive attacks, Denial of service, backdoors and trapdoors, sniffing, spoofing, man in the middle, replay, TCP/IP Hacking, encryption attacks. Malware : Viruses, Logic bombs

2. Organizational/ Operational security

- Role of people in security : Password selection, Piggybacking, Shoulder surfing, Dumpster diving, Installing unauthorized software / hardware, Access by non employees, Security awareness, Individual user responsibilities
- Physical security : Access controls
Biometrics : finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns, keystrokes, Physical barriers
- Network security basics, model for network security

3. Cryptography and Public key Infrastructure

- Introduction : Cryptography, Cryptanalysis, Cryptology, Substitution techniques : Caesar's cipher, monoalphabetic and polyalphabetic, Transposition techniques - Rail fence technique, simple columnar, Steganography
- Hashing - concept
- Symmetric and asymmetric cryptography : Introduction Symmetric encryption : DES (Data encryption standard) algorithm, Diffie-Hellman algorithm, Problem of key distribution, Asymmetric key cryptography : Digital Signature, Key escrow
- Public key infrastructures : basics, digital certificates, certificate authorities, registration authorities, steps for obtaining a digital certificate, steps for verifying authenticity and integrity of a certificate
- Trust models : Hierarchical, peer to peer, hybrid

4. Network security

- Firewalls : concept, design principles, limitations, trusted systems, Kerberos - concept
- Security topologies - security zones, DMZ, Internet, Intranet, VLAN, security implication, tunneling
- IP security : overview, architecture, IPSec, IPSec configurations, IPSec security

- Virtual Private Network
- Email security : Email security standards : Working principle of SMTP, PEM, PGP, S/MIME, spam,
- IP security : overview, architecture, IPSec, IPSec configurations, IPSec security
- Virtual Private Network
- Email security : Email security standards : Working principle of SMTP, PEM, PGP, S/MIME, spam,

5. System security

- Intruders, Intrusion detection systems (IDS), host based IDS, network based IDS
- Password Management, vulnerability of password, password selection strategies, components of a good password
- Operating system security : Operating system hardening, general steps for securing windows operating system, Hardening Unix/Linux based operating system, updates : hot fix, patch, service pack

6. Application and web security

- Application hardening, application patches, web servers, active directory
- Web security threats, web traffic security approaches, secure socket layer and transport layer security, secure electronic transaction
Software development : secure code techniques, buffer overflows, code injection, least privilege, good practices, requirements, testing

Reference :

1. Cryptography and Network Security (*Atul Kahate*) Tata-McGraw-Hill Sixth reprint 2006.
2. Cryptography and Network Security Principles and Practices (*William Stallings*) Pearson Education, Third Edition.
3. Computer Security (*Dieter Gollman*) Wiley India Education, Second Edition.
4. Computer Security Basics (*Deborah Russell G.T.Gangenisr*) O'Reilly publication.
5. Principles of Computer Security Security + and Beyond (*Wm. Arthur Conkin Dwayne Williams Gregory B. White Roger L. Davis Chuck Cothren*) Mc Graw Hill Technology Education International Edition 2005.
4. Websites : www.pgpi.org/doc/pgpintro

Operating System [OPS]

T.Y. Diploma : Sem V
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Theory Exam	3 Hrs.	100
Practical Exam	–	–
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@ Internal Assessment

SYLLABUS

1. Introduction

- Operating system, Evolution, Generations -1st, 2nd, 3rd, 4th.
- Mainframe Systems - Batch, Multi programmed, Multitasking, Time sharing, Desktop.
- Multiprocessor Systems
- Distributed Systems.
- Clustered Systems.
- Real Time Systems.
- Recent Operating System Characteristic -XP,WIN-07

2. Operating System Structures

- System components activities - Process management, Main memory management, File management, I/O system management, Secondary storage management.
- Operating system services.
- System calls - Uses, process control, file management, Device management, Information maintenance, communication.
- Operating system structure. Simple structure, layered, monolithic, microkernel.
- Booting

3. Process Management

- Processes - Concept, process, state, process control block.
- Process scheduling - Scheduling queues, scheduler, context switch.
- Operations on processes - creation, termination.
- Inter process communication.
- Threads - Benefits, user and kernel threads.
- Multithreading Models - Many to one, one to one, many to many.

4. Scheduling

- Scheduling - Objectives, concept, criteria, CPU and I/O burst cycle.
- Types of Scheduling-Pre-emptive, Non pre-emptive.
- Scheduling Algorithms. First come first served (FCFS), Shortest job first (SJF), Round Robin (RR), Priority.
- Other Scheduling. Multilevel, Multiprocessor, real-time.
- Deadlock. System model, principle necessary conditions, mutual exclusion, critical region.
- Deadlock handling. Prevention, avoidance algorithm-Bankar's algorithm, Safty algorithm

5. File System and Memory Management

- File- Concept, Attributes, Operations, Types, Structure
- Access Methods - Sequential, Direct.
- Swapping
- Allocation Methods - Contiguous, Linked, Indexed.
- Directory Structure - Single level, Two level, Tree Structure
- Protection-Types of accesses, Access control.
- Basic Memory Management-Partitioning, Fixed & Variable.
- Free Space management techniques-Bitmap, Linked List.
- Virtual Memory - Concept, Paging, Page fault, Page Table.
- Page Replacement algorithms - FIFO(First in First out), Optimal Page replacement, LRU (Least recently used), NRU (Not recently used).

Reference :

1. Operating System Concepts (Silberschatz Galvin, Gagne) John Wiley & Sons (Asia) Pte ltd.
2. Operating Systems (Achyut S. Godbole) Tata McGraw-Hill
3. Modern Operating Systems (Andrew S. Tanenbaum) Prentice Hall of India
4. Unix Concepts and Applications (Sumitabha Das) Tata McGraw-Hill
5. Unix Concepts and Programming (Murugan Sethuraman) Denett & Co.
6. Unix Shell Programming (Yashwant Kanetkar) BPB Publication
7. Websites : www.denett.com
www.tatamcgrawhill.com
www.phindia.com
www.wiley.com/college/silberschatz6e/0471417432/slides/ppt
www.en.wikipedia.org
www.computerworld.com
www.computer.howstuffworks.com
www.willamstallings.com/os4e.html
www.deitel.com/books/os3e/slides.html

Data Base Management [DBM]

T.Y. Diploma : Sem V
[CO/CM/IF]

(Elective–I)

EVALUATION SYSTEM

	Time	Marks
Theory Exam	3 Hrs.	100
Practical Exam	–	–
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Term Work	–	25@
Class Test (Two Test)	–	25 (each)

@ Internal Assessment

SYLLABUS

1. Oracle Architecture.

- Components of Oracle Architecture : Structures for connecting a user to an oracle Instance, Common database administrative tools for DBA, features of the oracle universal Installer, Optimal flexible architecture, Setting of Password file authentication, main components of oracle enterprise manager and their uses.
- Maintaining Control file : Use of control file, Control file, Multiplex and manage the control file, manage control file with oracle managed files.
- Managing an Oracle Instance : Create and manage Initialization parameter files, configure OMF, startup & shutdown an instance, monitor the use of diagnostic files
- Creating a Database : Prerequisite for database creation, creating a database using oracle database configuring assistant, Creating a database manually
- Maintaining redo log files : Purpose & structure of online redo log files, Control lock switches and check points, Multiplex and maintain online redo log files, Manage online redo log files with OMF.

2. Managing Users, Role and Database Objects.

- Managing users, privileges and roles : Creating new database users alter and drop existing database users, Monitor information about existing users, Identify system and object privileges, grant and revoke privileges, identify auditing capabilities, create and modify roles, Control availability of roles, remove roles, user predefined roles, display role information from the data dictionary.
- Managing table spaces : Managing table spaces, data files, tables, undo data and indexes logical structure of table spaces within the database, create table spaces, change the size of the table space allocate table space for temporary segments, Change the status of table spaces, change the storage setting of table spaces, implement oracle managed files, various methods of storing data, oracle data tupes, distinguish between an extended versus a restricted row id, structure of a row, creating regular and temporary tables, manage storage structures within a table, reorganize truncate, drop a table, purpose of undo data, automatic undo management different types of indexes and their uses creating, reorganizing and dropping indexes, get index information from the data dictionary.
- Storage structure and relationships : Logical structure of segments, segment types and uses, keywords that control block spaces usage, get information about storage structures from the data dictionary.
- Data dictionary content and usage : Data dictionary components, contents and uses of data dictionary, query the data dictionary.
- Managing password security, resources and data integrity, Manage passwords using profiles, administrator profiles, control use of resources using profile, implement data integrity constraints, maintain integrity constraints, obtain constraint information from the data dictionary.

3. Oracle Backup and Recovery

- Backup and recovery overview.
Basics of database backup, restore and recovery, types of failure in an oracle environment, backup and recovery strategy.
- Instance and media recovery structures.
Oracle processes, memory structures and files related to recovery, importance of check points, redo log files and archived log files, instance recovery.
- Configuring the database archiving mode Difference between archive log and no archive log modes; configure a database for archive log mode, automatic archiving, multiple archiving processes.
- Oracle recovery manager overview and configuration. RMAN features, components, configuring RMAN.
- User managed backups and RMAN backups.
User managed backups and recovery operations, backup issues with read table spaces, perform closed and open database backups, backup the control file, cleanup after a failed online backup, DB verify utility to detect corruption, types of RMAN specific backups backing up with RMAN, copy command to create image copies.
- User managed complete recovery and RMAN complete recovery. Recovery in non archive log mode and complete recovery in archive log mode using user managed and RMAN, restore data files to different locations, relocate and recover a table space by using archived redo log files.
- User managed incomplete recovery and RMAN incomplete recovery. Necessity of incomplete recovery, Methods for incomplete recovery, incomplete recovery with user managed backups, incomplete recovery using RMAN and using enterprise manager, recovery of the control file, recovery through reset logs.
- RMAN maintenance and recovery catalog creation and maintenance. Cross checking of backups, updating the repository, changing the status of backup and copies, catalog backups made with operating system commands, contents of recovery catalog, creating the recovery catalog and maintaining it by using RMAN commands, using RMAN to register, resynchronize and reset a database, querying recovery catalog to generate reports and lists, create, store and run scripts.

4. Oracle Networking

- Networking overview and basic oracle net architecture. Managing complex networks, oracle networking add-on solutions, components of oracle net layered architecture, oracle net services role, web client connections through oracle networking.
- Configuring oracle networking.
Establishing a session, creating and managing a listener, database registration, the listener control utility, techniques for name resolution, configuring service aliases, advanced connection options, testing oracle net connections.
- Managing shares servers
Limitations of dedicated server architecture, shared server architecture, configuring shared server, monitoring the shared server when to use the shared server

5. Oracle performance and tuning overview

- Tuning application design, tuning SQL, tuning memory usage, tuning data access, tuning data manipulation, tuning physical storage, reducing network traffic, using STATSPACK and the automatic work load repository, using STATSPACK, tuning tools, alert log, background trace file, server generated alerts, user trace files.

Reference :

1. Oracle Database Log, OCP Certification All in one Exam guide Oracle Pears.
2. Oracle Database DBA Handbook, Oracle Pears
3. Oracle 9I Database: Fundamentals II exam guide (*Rama Velpuri*)
4. Websites : www.oracle.com/technology/pub/articles/tech_dba.html
www.oracle.com/technology/oramag/oracle/03-may/0330cp.html

Multimedia and Animation Techniques [MAT]

T.Y. Diploma : Sem V
[CO/CM/IF]

(Elective-I)

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@ Internal Assessment

SYLLABUS

1. Multimedia Elements Multimedia Application

- **I/P, O/P devices**
Limitations of Traditional Input Device, Digital v/s Analog, Input- Pen-Input, Image Scanner, Charge Coupled Devices, MIDI, Digital Camera, Output, Display System Technology, CRT display System, Display Terminology, Flat Panel Display, Print o/p technology, Dye Sublimation
- **Evaluation of Multimedia systems**
Multimedia Elements (Fasimile, Document image, photographs image, Geographics information system maps, Fullmotion and live video, Holographics images Fractcals). Multimedia Application(Document imaging , Image processing and Image Enhancement, OCR, Handwriting recognition, Non textual Image recognition, Full motion Digital Video application and Electronics messaging). Multimedia System Architecture, Evolving Tech. for Multimedia, Defining Objects for Multimedia Systems, Multimedia Data Interface Standard
- **Storage media**
Magnetic Media Technology, Hard disk Technology, RAID, Criteria for Selection of RAID, Use of Magnetic Storage in Multimedia, Optical Media, Magneto Optical

2. Architecture & Issues For Distributed Multimedia System.

- Multimedia System Architecture.
- Distributed Multimedia.
- Synchronization, Orchestration & QOS Architecture
- Framework for Multimedia System.

3. Compression/Decompression & File Formats

- **Need , Types , Evaluating & Visibility** : Evaluating the Compression System, How much, Compression, How Good is Picture, How fast Does it Compress or Decompress, What H/W & S/W Does it take, Redundancy & Usability
- **Compression and Decompression** : Types of compression ,Need of Data Compression ,Color Gray Scale and Still Video Image , Color Characteristics , Color Model
- **Video Compression Technique** : Simple Compression Technique, Interpolative, Predictive, Transfer Coding, Discrete Transfer, Statistical (Huffman, arithmetic)JPEG Compression, Requirement Addressing JPEG, Definition of JPEG Standard, Overview of JPEG Components, JPEG methodology, The discrete cosine Transfer , Quantization, Zigzag Sequence, Encoding
- **Introduction to Standardization of Algorithm**
- **File Formats**
- **History of RIF, TIFF** : TIFF Specification , TIFF structure , TIFF tag ,TIFF Implementation issues , TIFF classes RIFF Chunks with two sub chunks , List chunk , RIFF waveform Audio File format , RIFF MIDI file Format, RIFF DIB's,

- **Introduction to RIFF, AVI** : RIFF AVI File format, Index Chunk and Boundary condition handling for AVI files., AVI Indeo File Format.
- JPEG-objectives, Architecture, JPEG-DCT encoding Quantization.
- JPEG-stastical coding, predictive lossless coding, JPEG performance
- MPEG-objectives, Architecture, BIT stream syntax performance
- MPEG2 & MPEG4

4. **Multimedia Authoring and User Interface**

- Multi Media Authoring System and its type
- Hypermedia Application Design consideration
- User Interface Design
- Information Access
- Object Display / Playback Issues

5. **Distributed Multimedia Systems**

- Components of Distributed Multimedia Systems
- Distributed Client Server Operation
- Multimedia Object Server
- Multi Server Network topologies
- Distributed Multimedia Databases

6. **Multimedia Tool**

- Introduction to Multimedia tool - Flash
- Creating & Modifying elements
- Line tool, fill/attributes, different shapes, text tools & pen tool
- Selecting lines fill with arrow tool, selecting shapes, using lasso tool performing basic editing tools, selecting & deselecting elements, modifying created objects.

Reference :

1. Multimedia Systems Design (*Prabhat k. Andheigh, Kiran Thakrar, John F*) Prentice Hall of India.
2. Multimedia Systems (*Koegel Buford*) Pearson Education.
3. Micromedia Flash for Windows and Macintosh (*Katherine Ulrich*) Pearson Education
4. Multimedia Communication (*Free Halshall*) Pearson Education
5. Multimedia Computing, Communication and Application (*R. Steimnetz, K. Nahrstedt*) Pearson Education.
6. Multimedia Communication Directions and Innovations (*J.D. Gibson*) Academic Press, Hardcourt India.
7. Computer Networking (*J.F. Kurose, K. W. Rose*) Pearson Education.

Advanced Microprocessor [AMP]

T.Y. Diploma : Sem V
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(Elective-I)

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SYLLABUS

1. 16-bit Microprocessor - Intel 80286.

- Salient features, Internal architecture, Register organization. (General purpose register, segment register, status and control register, instruction pointer, segment descriptor cache register)_
- Addressing mode such as Real, Protected Virtual Addressing mode, Selector, Descriptors and its types, LDT, GDT, IDT, privilege protections. Operations of 80286 in Real and PVAM.

2. 32-bit Microprocessor -Intel 80386.

- Salient features, internal architecture, Register organization (General-purpose register, segment register, status and control register, instruction pointer. Segment descriptor cache register. System address register LDTR & GDTR, TR, Debug register, Test registers, Control register.
- Addressing modes of 80386, real, PVAM, paging, virtual 8086.
Address translation in real, PVAM, paging, Enabling and disabling paging (Machine Status word)

3. Interrupts of X86 microprocessor:

- Introduction to X86 interrupts (Hardware, software and exceptions), Interrupt vector table, Interrupt processing sequence. Hardware or exception interrupts (Singles step, divide by zero/overflow, non-maskable, breakpoint, overflow) software interrupts (INT, INTO instructions)
- Introduction to MS-DOS, The structure of MS-DOS (BIOS Module, DOS kernel, command processor), Loading of MS-DOS introduction to .COM and .exe programs, DOS & BIOS Interface, Interrupt Services, DOS& BIOS Interrupts.

4. Advanced Microprocessors (Intel 486 & Pentium)

- Salient features of 486.
Salient features of Pentium System architecture (Superscalar Execution, Separate code & data cache, Floating Point Exceptions, Branch prediction..

Reference :

1. IBM-PC assembly language & programming (Peter Abel) Prentice Hall India
2. Advanced microprocessor & peripheral (A. K. Ray., K. M. Bhurchandi) TATA McGraw Hill.
3. Advanced MS. DOS Programming (Ray Duncan) BPB Publication
4. Websites : www.intel.com
www.pcguides.com/ref/CPU
www.techsource.com/engineering_parts/microprocessor.html

Windows Programming

T.Y. Diploma : Sem V
[CO/CM/IF]

(Elective-I)

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Theory Exam	3 Hrs.	100
Practical Exam	–	–
Oral Exam	–	–
Term Work	–	25@
Class Test (Two Test)	–	25 (each)

@ Internal Assessment

SYLLABUS

1. Overview of Windows messaging.

- The Windows Environment, History of Windows, Aspects of Windows, Windows Programming Options, APIs and Memory Models, The Programming Environment, Your First Windows Program,
- The MessageBox Function, A Brief History of Character Sets 20 American Standards, Wide Characters and C, The char Data Type, Windows' String Functions, Using printf in Windows, Formatting Message Box.
- Registering the Window Class, Creating the Window, Displaying the Window, the Message Loop, and the Window Procedure.

2. GDI and Basic Drawings

- An Introduction to GDI, The Structure of GDI, The GDI Philosophy, The GDI Function Calls, The GDI Primitives, The Device Context.
- Drawing Dots and Lines, Setting Pixels, Filling in the Gaps, Drawing Filled Area, The GDI Mapping Mode Rectangles, Regions, and Clipping.

3. The Keyboard

- Keyboard Basics, Keystrokes and Characters, Using Keystroke Messages, Character Messages, Keyboard Messages and Character Sets, The KEYVIEW1 Program, The Foreign-Language Keyboard Problem, The Caret (Not the Cursor), The Caret Functions.

4. The Mouse

- Mouse Basics, Client-Area Mouse Messages, Simple Mouse Processing: An Example, Mouse double-clicks, Nonclient-Area Mouse Messages, The Hit-Test Message, A Sample Program
- Emulating the Mouse with the Keyboard, Using Child Windows for Hit-Testing, Capturing the Mouse.

5. Client Window Controls

- The Button Class, Creating the Child Windows, Push Buttons, Check Boxes, Radio Buttons, Group Boxes, Changing the Button Text, Visible and Enabled Buttons, Buttons and Input Focus, Controls and Colors, System Colors, The Button Colors, The WM_CTLCOLORBTN Message,
- The Scroll Bar Class 383 The COLORS1 Program Coloring the Background, Coloring the Scroll Bars and Static Text, The Listbox Class, List Box Styles, Putting Strings in the List Box, Selecting and Extracting Entries, A Simple List Box Application._

Reference :

1. Programming Windows (Charles Petzold) Microsoft Press.
2. Win32 Programming (Brent E. Rector Joseph M. Newcomer) Addison Wesley.
3. Websites : [http://elvis.rowan.edu/~kay/cpp/vc6 tutorial/](http://elvis.rowan.edu/~kay/cpp/vc6/tutorial/)
<http://www.onesmartclick.com/programming/visual-cpp.html>
<http://www.functionx.com/visualc/>