

**Dr . BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY,
AURANGABAD**



**PROPOSED
SCHEME AND DETAILED SYLLABUS
of
Third Year Engineering of Computer Science & Engineering TE(CSE)
of
FOUR YEAR DEGREE COURSE IN ENGINEERING**

With Effect from Academic Year 2013-2014

**Faculty of Engineering and Technology
Board of Studies in Computer Science and Engineering
Curriculum structure of T.E(Computer Science and Engineering)**

Sub Code	Semester-I	Contact Hrs/Week				Examination Scheme					
	Subject	L	T	P	Total	CT	TH	TW	PR	Total	Duration of The Theory Examination
CSE301	Operating System	4	--	--	4	20	80	--	--	100	3 Hrs
CSE302	Software Engineering	4	--	--	4	20	80	--	--	100	3 Hrs
CSE303	Database Management System	4	--	--	4	20	80	--	--	100	3 Hrs
CSE304	Programming in Java	4	--	--	4	20	80	--	--	100	3 Hrs
CSE305	Digital Image Processing	4	--	--	4	20	80	--	--	100	3 Hrs
CSE321	LAB-I Database Management System	--	--	2	2	--	--	--	50	50	
CSE322	LAB-II Programming in Java	--	--	2	2	--	--	--	50	50	
CSE323	LAB-III Digital Image Processing	--	--	2	2	--	--	50	--	50	
CSE324	LAB-IV Software Development Lab- I (Windows.Net Framework & C# programming)	2	--	2	4	--	--	--	50	50	
BSH331	Communication Skills-II	--	--	2	2	--	--	--	50	50	
	Total	22	--	10	32	100	400	50	200	750	

Sub Code	Semester-II	Contact Hrs/Week				Examination Scheme					
	Subject	L	T	P	Total	CT	TH	TW	PR	Total	Duration of The Theory Examination
CSE351	Advanced JAVA	4	--	--	4	20	80	--	--	100	3 Hrs
CSE352	Design & Analysis of Algorithms	4	--	--	4	20	80	--	--	100	3 Hrs
CSE353	Software Testing & Quality Assurance	4	--	--	4	20	80	--	--	100	3 Hrs
CSE354	Computer Networks- II	4	--	--	4	20	80	--	--	100	3 Hrs
CSE355	Theory of Computation	4	--	--	4	20	80	--	--	100	3 Hrs
CSE371	LAB-V Advanced JAVA	--	--	2	2	--	--	--	50	50	
CSE372	LAB-VI Design & Analysis of Algorithms	--	--	2	2	--	--	--	50	50	
CSE373	LAB-VII Software Testing & Quality Assurance	--	--	2	2	--	--	50	--	50	
CSE374	LAB-VIII Computer Networks- II	--	--	2	2	--	--	50	--	50	
CSE375	LAB-IX SDL-II (Mobile Application Development Lab)	2	--	2	4	--	--	--	50	50	
	Total	22	--	10	32	100	400	100	150	750	
	Total of Semester I & II	44	--	20	64	200	800	150	350	1500	

L:Lecture hours per week **T:**Tutorial hours per week

P:Practical hours per week

CT: Class Test

TH:University Theory Examination

TW: Term Work

PR: Practical/Oral Examination

Dr Vijaya B. Musande
Chairman Board of Studies
Computer Science & Engineering

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FACULTY OF ENGINEERING AND TECHNOLOGY
Third Year Engineering (CSE/IT)
Semester – I

Course Code : CSE301

Title :- Operating Systems (OS)

Teaching Scheme

Theory: 4 Hours/Week

Examination Scheme

Class Test: 20 Marks

Theory Examination (Marks) :80 Marks

Theory Examination (Duration) :03 Hours

Prerequisite

1. Understanding of Data Structures and Digital Electronics.
2. Knowledge of Basic Computer, Hardware Components, Microprocessor and peripheral Components.
3. Programming skills in C , C++ and JAVA. Hands on practice of UNIX OS.

Objectives:

1. Student should learn fundamentals which will help them to understand design of modern operating system.
2. To study different components of OS.
3. Students should have overview of different Types and Structure of OS.
4. Students should learn important system resources and their management policies.

CONTENTS

SECTION-A

UNIT 1:- Introduction

(6 hrs)

- **Operating System Objectives and Functions:** The OS as a User/Computer Interface, OS as a resource manager.
- **Evolution of Operating system :**Batch System, multiprogramming ,Time sharing, multitasking, distributed , Handheld Computer System, Embedded OS, Real Time, Smart Card OS
- **Operating System Structure :** Monolithic Systems, Layered Systems, MicroKernels, Client Server Model Virtual Machines, Exokernels
- **System Calls and Shell**

UNIT 2: Process Management

(8 hrs)

- Process concept, Process states-(two state, five state), Process Description, PCB,
- CPU scheduling- scheduling criteria, scheduling Algorithms.
- **Thread :** Process and Threads, Thread functionality, User level and Kernel Level Threads
- **Process Synchronization** Principle of concurrency , Race condition, Critical Sections/Regions ,Mutual Exclusion, Sleep and wakeup
- Producer consumer problem ,Semaphore ,Monitors, Message Passing
- Dining Philosopher Problem ,Readers and writers problem

UNIT 3 : File Systems

(6 hrs)

- **Overview:** File, File Management System, File System Architecture, File Management Functions.
- **File Organization and access**
- **File System Layout**
- **File Directories, File Sharing.**
- **Secondary Storage Management :** File Allocation ,Disk space management, File System Consistency and Performance
- **Comparison of Windows and UNIX File System**

SECTION-B

UNIT 4: Memory Management

(8 hrs)

- **Memory Management Requirements:** Relocation, Protection, Sharing, Logical Organization, Physical Organization.
- **Memory Partitioning:** Fixed, Dynamic Partitioning, Buddy Systems ,Relocation
- **Fragmentation, Swapping.**
- **Managing free Memory:** Memory management with bitmap, linked list.
- **Paging :** Basic Method ,Hardware support , Structure of page Table.
- **Segmentation:** Basic Method ,Hardware.
- **Virtual Memory:** Demand Paging, Page replacement Algorithms- optimal, FIFO, LRU, Allocation of Frames, Thrashing and Working Set Model.

UNIT 5:- Device Management

(6 hrs)

- **Principles of I/O Hardware :**I/O devices, Device Controllers,
- **Principle of I/O software**
- **I/O Software Layers**
- **Disk:** Disk hardware –Magnetic Disk, RAID, CDs, DVDs, Disk Formatting, Disk Scheduling Algorithms, Clocks.

UNIT 6:- Deadlock and case study

(6 hrs)

Deadlock

- System model, Characterization,
- Deadlock Prevention
- Deadlock avoidance –Bankers Algorithm for single and multiple resources,
- Deadlock detection and recovery.

Case study of Window 7

- History of Windows
- System Structure
- Windows Registry
- Process and thread management,Concurrency control,
- Memory Management and I/O Management,
- Security

Text Books:

1. Abraham Silberschatz, Peter Galvin, "Operating System Concepts", 6th edition, Addison Wesley,
2. Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall 3rd Edition
3. Andrew S. Tanenbaum, "Operating System Design & Implementation", Second edition, Pearson Education
4. William Stallings, "Operating systems", Prentice Hall, 4th Edition.

Reference Books:

1. Deital H.M., "Operating Systems", Addison Wesley, Addison Wesley,
2. William Stallings, "Operating systems internals and Design Principles", Pearson Education. 6th Edition.
3. Milan Milenkovic, "Operating System: Concepts & design" - TMH publication
4. Dhamdhare, "Operating System -A Concept based approach" Third edition, Mc Graw Hill Publication.

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
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Third Year Engineering (CSE/IT)
Semester – I

Course Code :CSE302

Title :- Software Engineering(SE)

Teaching Scheme

Theory: 4 Hours/Week

Examination Scheme

Class Test: 20 Marks

Theory Examination (Marks) :80 Marks

Theory Examination (Duration) :03 Hours

Prerequisite

1. Experience of developing Mini Projects
2. Concepts of Object Oriented Programming (Covered at SE level).

Objectives:

1. To learn & understand how to implement different phases of Software Engineering like requirement analysis, design, coding, and testing for software development
2. To learn and develop the software projects using the Object-Oriented Software Engineering
3. To learn the Web Engineering for initiating WebApps using the concepts of Software Engineering

CONTENTS

SECTION-A

UNIT 1:- Product & the Process

(06 Hrs)

- Software-characteristics
- Components & Applications
- Software Myths
- Process Framework
- Capability Maturity Model
- Software Process Models - Waterfall Model, Linear Sequential Model, Prototyping Model, Spiral Model, RAD Model, Incremental Model.

UNIT 2:- Analysis

(08 Hrs)

- Requirement Engineering Tasks
- Initiating the Requirements Engineering Process
- Eliciting Requirements-Quality Function Deployment, Building Analysis Model
- Negotiating and Validating Requirements
- Software Project Estimation
- Decomposition Techniques
- Cost estimation
- Algorithmic models- COCOMO, Putnam, & Function Point Analysis
- Guidelines for Estimating Cost
- Distribution of Manpower over Time

UNIT 3:- Design & Coding

(06 Hrs)

Unit 3.1:- Design**(04 hrs)**

- Design Concepts-Abstraction, Architecture, Pattern, Modularity, Information Hiding, Functional Dependence, Refinement, Refactoring, & Design Classes
- Architectural Mapping Using Data Flow- Transform Mapping, Refining the Architectural design,
- User Interface Design Golden Rules

Unit 3.2:- Coding**(02 hrs)**

- TOP-DOWN and BOTTOM-UP Structure Programming
- Information Hiding
- Programming Style and Internal Documentation
- Verification
- Metrics
- Monitoring and Control

SECTION-B**UNIT 4:- Object Oriented Software Engineering****(08 hrs)**

- Foundations of the Object Model, OOP, OOD, OOA
- Object- Oriented Analysis- Classical Approaches, Behavior Analysis, Domain Analysis, Usecase Analysis, CRC Cards & Structured Analysis
- Object Oriented Design-UML Notations including Class, State Transition, Object, Sequence, & Module Diagram
- A Case Study

UNIT 5: Web Engineering for Web Apps**(06 hrs)**

- Attributes of Web-Based Systems and Applications
- WebApp Engineering Layers
- WebApp Engineering Process
- Requirements gathering for WebApps
- Planning for Web Engineering Projects
- Web Engineering Team

UNIT 6:- Software Testing and Software Management**(06 hrs)****Unit 6.1:- Testing****(03 hrs)**

- Software Testing Strategy for – Conventional & Object-Oriented Software Architecture
- Test Cases and Class Hierarchy
- Scenario Based Testing
- Testing Concepts for WebApps

Unit 6.2:- Software Management**(03hrs)**

- Project Management
- Risk management
- Change Management
- Version Management
- Project Scheduling
- Agile Planning

Text Books:

1. Pressman R., "Software Engineering, A Practitioners Approach", 6th Edition, Tata McGrawPublication, 2004, ISBN 007-124083 – 7
2. Pankaj Jalote , “Software Engineering “, Narosa Publishing House.
3. Hans Van Vliet, “Software Engineering Principles and Practice”, Wiley-India Publication, Third Edition
4. Grady Booch, “Object-Oriented Analysis and Design with Applications”, Pearson Education, Second Edition

References:

1. Peters J. Pedrycz W., "Software Engineering : An Engineering Approach", John Wiley & Sons, 2000 ISBN 9971-5 1-309-9
2. Rajesh Prasad, Yogesh Sharma, Nihar Ranjan, Bhavna Tiple, "Software Engineering" Pearson Education
3. Ian Sommerville, “Software engineering“, Pearson education, 6th edition.

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Semester – I

Course Code :CSE303

Title :- Database Management System(DBMS)

Teaching Scheme

Theory: 4 Hours/Week

Examination Scheme

Class Test: 20 Marks

Theory Examination (Marks) :80 Marks

Theory Examination (Duration) :03 Hours

Prerequisite

1. Programming in C Language
2. Object Oriented Programming
3. Discrete Mathematics

Objectives:

1. To give an introduction to Database Management Systems (DBMS)
2. To give emphasis on how to organize, maintain and retrieve efficiently and effectively, information from a DBMS

CONTENTS

SECTION A

UNIT 1: Introduction to Database Management Systems

(6 hrs)

- Introduction,
- An Example of Database,
- Characteristics of Database Approach,
- Actors on the Scene
- Workers Behind the Scene
- Advantages of using DBMS Approach
- A Brief History of Database Applications,
- Data Models, Schemas and Instances,
- Three Schema Architecture and Data Independence,
- Centralized and Client/Server Architectures for DBMSs

UNIT 2: Entity Relationship Model

(8 hrs)

- Entity Types, Entity sets, Attributes, Keys,
- Relationship Types, Relationship Sets, Roles, Structural Constraints,
- Strong and Weak entity types,
- E-R diagram:
 - Naming Conventions and Design Issues,
- Relationship Types of Degree higher than two,
- The Enhanced ER Model:
 - Subclasses, Superclasses and Inheritance
 - Specialization and Generalization,
 - Union Types using Categories
 - Data Abstraction

UNIT 3: The Relational Data Model and Relational Database Design**(6 hrs)**

- Relational Model Concepts,
- Relational Model Constraints and Relational Database Schemas
- Update Operations, Transactions and Dealing with Constraint Violations,
- Relational Database Design Using ER-to-Relational Mapping

SECTION B**UNIT 4: Relational Algebra and Normalization****(6 hrs)**

- Relational Algebra
 - Unary Relational Operations,
 - Relational Algebra Operations from set theory,
 - Binary Relational Operations,
 - Additional Relational Operations,
 - Examples of Queries in Relational Algebra,
- Normalization
 - Functional Dependencies
 - Normal Forms based on Primary Keys,
 - General Definitions of Second and Third Normal Forms
 - Boyce-Codd Normal Form
 - Properties for Relational Decompositions:
 - Relation Decomposition and Insufficiency of Normal Forms,
 - Dependency Preservation Property of a Decomposition,
 - Non-additive (Lossless) Join Property of a Decomposition,
 - Multi-valued Dependencies and 4NF,
 - Join Dependencies and 5NF.

UNIT 5: Structured Query Language**(06 Hrs)**

- Overview of SQL Query Language
- SQL Data Definition
- Basic Structure of SQL Queries
- Additional Basic Operations
- Set Operations
- NULL Values
- Aggregate Functions
- Nested sub-Queries
- Modification of the Database
- Join Expressions
- Views,
- Integrity Constraints
- Authorization
- Recursive Queries.

UNIT 6: Transaction Management**(8 hrs)**

- Transactions
 - Introduction to Transaction Processing

- o ACID Properties of Transactions,
- o Characterizing Schedules Based on Recoverability,
- o Characterizing Schedules Based on Serializability,
- Concurrency Control
 - o Concurrency Control Based on Lock Based Protocol,
 - o Deadlock Handling
 - o Multiple Granularity
 - o Timestamp Based Protocol,
 - o Validation Based Protocol,
- Database Recovery
 - o Recovery Concepts,
 - o Recovery Techniques.

Text Books:

1. Ramez Elmasri and Shamkant Navathe, “Fundamentals of Database Systems” (5th Ed.), Pearson Education.
2. Abraham Silberschatz and Henry Korth, S. Sudarshan, “Database System Concepts”, 6th Edition, McGraw-Hill International Ed.
3. G K Gupta, “Database Management System”, 1st Edition, Tata McGraw-Hill

Reference Books:

1. Thomos Conolly, Carolyn Begg, “Database Systems, A Practical Approach to Design, Implementation, and Management”, 4th Edition, Pearson Education.
2. Alexis Leon, Mathews Leon, “Database Management Systems”, Leon Press, Chennai & Vikas Publishing House pvt. Ltd. New Delhi.
3. Bipin Desai, “An Introduction to Database Systems”. West Publishing Company

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Third Year Engineering (CSE/IT)
Semester – I

Course Code :CSE304

Title :- Programming in JAVA(PLJ)

Teaching Scheme

Theory: 4 Hours/Week

Examination Scheme

Class Test: 20 Marks

Theory Examination (Marks) :80 Marks

Theory Examination (Duration) :03 Hours

Prerequisites

1. Basics of Programming Languages
2. Concepts of Object Oriented Programming languages.

Objectives:

The student will be able to:

1. Apply object oriented features to real time entities
2. Design and implement multithreaded programs
3. Manage errors and exceptions
4. Design and implement applet and graphics programming
5. Make use of Data streams in programs

CONTENTS

SECTION-A

UNIT 1:- Introduction

(8 hrs)

- Why Java? Java Virtual Machine, Byte Code, JIT Compiler.
- Accessing class members, Constructor, Methods Overloading, Static Member Inheritance, types of inheritance, Overriding Methods, Final variable and Methods, Final Classes
- Abstract method and Classes , Visibility Control Public access
- Array, Strings and Vectors Arrays, Vectors, Wrapper Classes
- Command line arguments in Java
- Study of java.lang, java.util packages

UNIT 2:- Interfaces and Packages

(6 hrs)

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

UNIT 3 :- Managing Errors and Exceptions, Multi Threading

(6 hrs)

- **Managing Errors and Exceptions:**Types of errors, Exception as objects, Exception hierarchy, User defined Exception, Use of try, catch, throw, throws In exception handling, Multiple catch statement, Using Exception for Debugging .
- **Multi Threading:** Creating Thread, Extending a thread class, Stopping and Blocking a thread, Life cycle of thread, Using thread methods, Thread exceptions, Thread priority, Synchronization, Implementing a 'Runnable' Interface

SECTION-B

UNIT 4 : Applet Programming, Event Handling and Swings

(10 hrs)

- **Applet Programming :** 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 .
- **Event Handling:** Event Classes, Event Listeners, Adapter Classes
- Introduction to Abstract Window Toolkit (AWT)
- **Swing:** Labels, Buttons, Canvases, Check Boxes, Choices, Text Fields And Text Areas, Lists, Panels, Windows and Frames, JApplet class, Menus And Menu Bars

UNIT 5: JDBC architecture

(4 hrs)

- JDBC drivers
- Establishing connectivity and working with connection interface
- Working with statements, Creating and executing static and dynamic SQL statements
- Working with Result Set

UNIT 6: I/O package and Network Programming

(6 hrs)

- **I/O Package:** Input streams, Output streams, Readers & Writers. Object serialization, Deserialization, Sample programs on IO files, Filter and pipe streams
- **Network Programming:** Networking Basics, Client-Server Architecture ,Socket Overview, Networking Classes and Interfaces, Network Protocols , Developing Networking Applications in Java .

Text/Reference books:

1. Patrick Naughton-HerbertSchildt , The Complete Reference-Java 2 (Third Edition) TMH
 2. E. Balagurusamy , Programming with Java , BPB Publication
 3. Deitel & Deitel: “How To Program JAVA”, Pearson Education
 4. Java 2 Black book by Steven Holzner
 5. Kathy Sieraa & Bert Bates, Head First Java(2nd Edition),O'reilly
 6. Darrel Ince &Adam Freeman ,programming the Internet with JAVA,Addison-Wesley
 7. Dr. G. T. Thampy, Object Oriented Programming in Java, Dreamtech Press
- **Web Site :**
<http://www.sun.java.com> (For downloading JDK for Practical)

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Third Year Engineering (CSE)
Semester – I

Course Code :CSE305

Title :- Digital Image Processing(DIP)

Teaching Scheme

Theory: 4 Hours/Week

Examination Scheme

Class Test: 20 Marks

Theory Examination (Marks) :80 Marks

Theory Examination (Duration) :03 Hours

Prerequisite

The students should have knowledge of

1. Elements of Visual Perception.
2. Basic linear algebra and Fourier transforms
3. Linear signals and systems
4. The sampling theorem, quantization.
5. Probability and set theory.

Objectives:

1. Students should be able to understand digital image processing beyond the fundamental or introductory level.
2. Students should be able to choose appropriate image processing algorithms to achieve a desired result.
3. Students should be able to properly implement DIP algorithms using modern computing tools such as MATLAB, and to interpret and present the results.
4. To study fundamentals of color Image Processing.

CONTENTS

SECTION-A

UNIT 1:-Digital Image Fundamentals

(8 hrs)

- **Introduction:** Image, Pixel, Digital Image
- **Fundamental steps and Components of Digital Image Processing**
- **Brightness adaption and discrimination**
- **Image sensing and Acquisition**
- **Image Sampling and Quantization:** Basic concepts in Sampling and Quantization, Representing Digital images, Spatial and intensity resolution.
- **Relationship between Pixels:** Neighbors of a Pixel, Adjacency, Connectivity, Regions, and Boundaries, Distance Measures,
- **Basic Intensity transformations:** Image Negatives, Log Transformation, Power law Transformations. Piecewise-Linear Transformation Functions
- **Histogram Processing:** Definition, Histogram Equalization
- **Image Transforms:** Discrete Fourier transform(DFT), DCT, Walsh Hadamard Transform,

UNIT 2:- Image Enhancement

(6 hrs)

Spatial Domain Methods:

- **Fundamentals of Spatial Filtering-** The Mechanics of Spatial Filtering, Generating Spatial Filter Masks .
- **Noise Model**
- **Smoothing Spatial Filters :** Linear filters – Mean filters Non-linear (Order Statistic filters) : Median, Mode, Max, Min filters,
- **Sharpening Spatial Filters:-** Foundation,Using the Second Derivative for Image Sharpening-The Laplacian. Unsharp Masking Highboost Filtering,Using First Order Derivative for (Nonlinear) Image sharpening- The Gradient

Frequency Domain Methods:

- **Image Enhancement by Frequency Domain Methods:** Basic steps for Filtering in Frequency Domain.
- **Frequency Domain low pass (Smoothing) and high pass (Sharpening) Filters**

UNIT 3 :- Image Compression

(6 hrs)

- **Fundamentals:**
- Coding Redundancy, Spatial and temporal (Interpixel) Redundancy, Irrelevant Information(Psychovisual Redundancy)
- Measuring image Information: Image Entropy, Fidelity Criteria, Image compression Model
- **Some Basic Compression Methods:** Lossless Compression methods-Huffman coding, LZW coding, Run- Length Coding, Lossy Compression methods:- Block Transform Coding,
- **Image File formats:** BMP, GIF, TIFF
- **Image Compression Standards:** Binary image compression Standards, Continuous Tone Still Image Compression Standard,

SECTION-B

UNIT 4:- Image Segmentation

(8 hrs)

- **Fundamentals :** Point , Line and Edge Detection, Detection of Isolated Points, Line Detection, Edge Models, Basic Edge detection, Canny edge detector
- **Thresholding :** Foundation, Basic Global Thresholding, Optimal global thresholding Multiple Thresholds, Variable , Multivariable Thresholding,
- **Region-Based Segmentation Methods:** Region Growing, Region Splitting and Merging,
- **Segmentation Using Morphological Watersheds**

UNIT 5: Morphological Image Processing and Color Image Processing

(6 hrs)

Morphological Image Processing

- Preliminaries ,Erosion and Dilation ,Opening and Closing
 - The Hit-or-Miss Transformation
 - Some Basic Morphological Algorithms: Boundary Extraction, Hole(Region) Filling, thinning
- Color Image Processing:**

- Color Fundamentals and Color Models
- Basics of Full-Color Image Processing
- Color Transformations

UNIT 6 :- Image Representation and Description

(6 hrs)

- Representation.
- Boundary Descriptors.
- Regional Descriptors

Text Books:

1. Rafael C Gonzalez, Richard E Woods, “Digital Image Processing”, Pearson Education
2. S.Jayaraman, S Esakkirajan,T Veerakumar “Digital Image Processing”, McGrawHill Publication.
3. Rafael C Gonzalez, Richard E Woods, Eddins, “Digital Image Processing using MATLAB”,Pearson Education

Reference Books:

1. Anil K Jain, “Fundamentals of Digital Image Processing”, PHI
2. B Chanda & Dutta Majumdar, “Digital Image Processing and Analysis”, PHI

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Semester – I

Course Code :CSE321

Title :- LAB-I Database Management System(DBMS)

Teaching Scheme

Practical: 2 Hours/Week

Examination Scheme

Practical /Oral Examination:50 Marks

Practical /Oral Examination (Duration) :- 03 Hours

Design, develop and implement the following Assignments in SQL using Oracle/DB2 environment.

Suggestive List of Practical Assignments:

Assignment No. : 1

Implementation of DDL commands of SQL with suitable examples

- Create Table
- Alter Table
- Drop Table

Assignment No. : 2

Implementation of DML commands of SQL with suitable examples

- Insert
- Update
- Delete

Assignment No. : 3

Implementation of different types of functions with suitable examples

- Number Functions
- Aggregate Functions
- Character Functions
- Conversion Functions
- Date Functions

Assignment No. : 4

Implementation of different types of operators in SQL

- Arithmetic Operators
- Logical Operators
- Comparison Operators
- Special Operators
- Set Operations

Assignment No. : 5

Implementation of different types of Joins

- Inner Join
- Outer Join
- Right Join
- Left Join
- Self Join
- Natural Join
- Equi Join

Assignment No. : 6

- Study & Implementation of
- Group by & Having Clause
 - Order by Clause
 - Indexing

Assignment No. : 7

- Study & Implementation of
- Sub queries
 - Views

Assignment No. : 8

- Study & Implementation of different types of constraints

Assignment No. : 9

- Study and Implementation of Database Backup & Recovery Commands
- Study and Implementation of Rollback , Commit , Save point

Assignment No. : 10

- Creating Database/ Table Space
- Managing Users : - Create User, Delete User
- Managing Passwords
- Managing roles :- Grant , Revoke

Assignment No.:11

- Study & Implementation of PLSQL

Assignment No.:12

- Study & Implementation of SQL Triggers

Mini Project to carry out following activities

- Application Requirement definition for real world database. Ex.:- Hospital Management, Library Management etc.
- Define ER model as conceptual data model that views real world as entities and relationships.
- Map ER-Model into relational model.
- Apply Normalization on relational model to avoid different types of anomalies and to reduce redundancy.
- Create normalized table structures to cover entities.
- Creation of sample data records
- Sample queries using SQL.
- Documentation of Project

Practical Examination:

Practical Examination should be conducted by internal examiner for three hours under the supervision of external examiner. External examiner should evaluate student by checking practical performance and conducting viva.

Dr. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD
FACULTY OF ENGINEERING AND TECHNOLOGY
Third Year Engineering (CSE/IT)
Semester – I

Course Code :CSE322

Title :- LAB-II Programming In Java

Teaching Scheme

Practical: 2 Hours/Week

Examination Scheme

Practical /Oral Examination :50 Marks

Practical /Oral Examination (Duration) :- 03 Hours

Design, develop and implement the following programs using Java language in LINUX/Windows environment.

List of Practicals

1. Write simple programs based on basic syntactical constructs of Java like:
 - a. Operators and expressions.
 - b. Looping statements.
 - c. Decision makings statements.
2. Write a Java Program to define a class, describe its constructor, overload the constructors and instantiate its object.
3. Write a Java Program to implement Wrapper classes and their methods.
4. Write a Java Program to implement inheritance by applying various access controls to its data members and methods. Demonstrate use of method overriding.
5. Write a program to demonstrate- use of implementing interfaces.- use of extending interfaces.
6. Write a program to implement the concept of multi threading.
7. Write a program to implement the concept of Exception Handling- using predefined exception.- by creating user defined exceptions.
8. Write a program to demonstrate database connectivity and add, delete, update and retrieve records from database using JDBC.
9. Write a program using Applet- to display a message in the Applet.- for configuring Applets by passing parameters.
10. Design a GUI interface using swing and implement event handling
11. Write program to demonstrate use of I/O streams.
12. Write a program to read and write from socket.

Practical Examination:

The Practical Examination shall consist of writing and performing an experiment and oral based on the syllabus. External Examiner shall provide list of experiments for practical examination. Practical Examination shall be conducted under the supervision of external examinee. External examiner shall evaluate each performance. Successful execution of experiment is must in practical examination. Duration of practical examination is two hours.

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Third Year Engineering (CSE)
Semester – I

Course Code :CSE323

Title :- LAB-III Digital Image Processing

Teaching Scheme

Practical: 2 Hours/Week

Examination Scheme

Term Work : 50 Marks

Suggestive list of experiments:

Develop and implement the following programs using C/C++/MATLAB/ JAVA/ .NET on LINUX/Windows environment.

1. Write a Program in C to read image and display its histogram.
2. Program to enhance an image using image arithmetic and logical operations
3. Program for contrast enhancement in an image using histogram equalization
4. Program to filter an image using averaging low pass filter in spatial domain
5. Program to sharpen an image using 2-D Laplacian high pass filter in spatial domain
6. Program for detecting edges in an image using Roberts cross-gradient operator and Sobel operator
7. Program to smooth an image using low pass filter in frequency domain
8. Program to sharpen an image using high pass filter in frequency domain
9. Program for morphological image operations- erosion, dilation, opening and closing.
10. Program for removal of false edges in an image using morphological processing (thinning algorithm)
11. Program for illustrating color image processing.
12. Programs for region description and boundary representation.

TERM WORK

The term work shall consist of at least 8 experiments/ assignments based on the syllabus above and a group of 2-3 students must develop mini projects or small application.

Assessment of term work should be done as follows

- Continuous lab assessment
- Actual practical performance in Laboratory.
- Oral Examination conducted (internally) at the time of submission.

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Third Year Engineering (CSE/IT)
Semester – I

Course Code :CSE324

Title :- LAB-IV Software Development Lab –I
(Windows .Net Framework & C# programming)

Teaching Scheme

Theory :- 2 Hours/Week

Practical: 2 Hours/Week

Examination Scheme

Practical /Oral Examination :03 Hours

Practical /Oral Examination :50 Marks

Prerequisite

1. Programming in C Language (Covered at FE level).
2. HTML, JavaScript (Covered at SE level).
3. PHP/Mysql (Covered at SE level).

Objectives:

Students should be able

1. To effectively use visual studio .NET.
2. To understand how to develop GUI application under .NET.
3. To get aware of the C# programming language.

CONTENTS

UNIT 1:- Introduction to the .NET Framework and C#

(3 Hrs)

- .NET Architecture,.NET Class Library
- Introduction To Visual Studio IDE
- Introduction to C#, Data Types ,Variables and expressions
- Control statements , functions
- Namespaces, Assembly
- Components of Assembly, Private and Shared Assembly

UNIT 2 : Object-Oriented Programming in C#

(3 Hrs)

- Classes, Objects, Inheritance, Polymorphism
- Abstract Classes, Interfaces ,Operator Overloading
- Delegates, Exception Handling

UNIT 3 : Windows Programming

(4 Hrs)

- TextBox, Label, Buttons, Mouse\Keyboard Event Handling,

- Check Boxes, RadioButtons, Panel, Tool Tips
- List Box, Combo Box, Calendar Control
- List View, Tree View, Tab Control,
- Menu, Multiple document interface

UNIT 4 : Database Handling

(3 Hrs)

- ADO.NET, Static and Dynamic Data Binding
- ADO.NET architecture, data control, data source control
- Introduction to Language Integrated Query (LINQ) ,
- Querying a Database with LINQ
- Deployment of windows application

UNIT 5 : Web Application with ASP.NET

(3 Hrs)

- Introduction to Web Application, ASP.NET page lifecycle.
- Server Side Controls and Client Side Controls
- Basic Controls ,Link button ,Image Button,Image Map
- Validation Controls , AdRotator

UNIT 6 : Web Application with ASP.NET

(4 Hrs)

- Navigation Controls, Session Tracking
- Database Handling, Event Handling,
- Creating and deploying web services
- Deployment of Web Application

Text/Reference Books:

1. “C# 2010 Programming”, Black Book, Dreamtech Press
2. Karli Watson, Christian Nagel, Jacob Hammer Pedersen, Jon D. Reid, Morgan Skinner - “Beginning Visual C# 2010”, WILEY publication
3. Harvey and Paul Deitel Pearson Visual C# 2010 How to program. Prentice-Hall Inc, 2011, Fourth Edition
4. Head First C#, O’Reilly Microsoft Visual C# 2010 Step by Step, Microsoft Press

List of Experiments:

Part A: Console Application

- 1 Write a console application using control statements
- 2 Write a console application using classes
- 3 Write a console application using inheritance and abstract class
- 4 Write a console application using interface and exception handling

Part B: Windows Application

- 5 Design a form to take employee/Student information by using basic controls and display the information on the new form. (Use labels, Textbox, List, Radio button, etc)
- 6 Create a MDI form containing 2 menus – Current Releases & Forthcoming. Current Releases should contain 2 sub-menus – Hindi & English. Each menu opens a form containing some list of

specific films in combo-box. When you select the name of the film, its information such as star-cast, movie type(comedy/suspense/action/drama etc), production etc should be displayed in labels. It should also show its ratings in the status bar. When you click on “Forthcoming films”, it should open a form containing some names of films in list-box. The list of films and information about each film should be specified in array-list.

- 7 For an Employee table containing EmpNo, EmpName & EmpSal, design a form that allows user insert, update and delete employee details .Use data reader to display information of each employee one by one.

Part C:Web Application

- 8 Create a web site of your name that takes your details as input such as name,addr, hobbies, class ,college etc . Use the validator control to validate the information also show your information.
- 9 . Assuming that there are 2 tables – Cust(AccNo, HolderName, Password, CurrBal) & Transactions(TransId, AccNo, Date, Amt, TransType, ClientName) where TransType can be Debit or Credit. User should input AccNo and password. For successful login, it should show welcome message with the user’s name, current balance and transactions of the current month in table. [Use datagrid to display data from table]
- 10 Create a web service and use it in web site.
- 11 Mini Project

Extra Practicals (suggestive list)

- 1 Create a reservation form for Mumbai-Pune journey, containing 3 text-fields to enter names, age and a text field to show final bill. It should also contain a radio buttons showing the type of journey(AC or NonAC). Charges of AC/NonAC mode of journey is fixed. But only for children(age <5) and senior citizens(age>60), the rates are half. 4% service charges are applied on final amount. Also include facilities snacks, drinking water etc.As per the passengers entered by user, display the final bill.
- 2 Create a MDI form containing 2 menus – Current Releases & Forthcoming. Current Releases should contain 2 sub-menus – Hindi & English. Each menu opens a form containing some list of specific films in combo-box. When you select the name of the film, its information such as star-cast, movie type(comedy/suspense/action/drama etc), production etc should be displayed in labels. It should also show its ratings in the status bar. When you click on “Forthcoming films”, it should open a form containing some names of films in list-box. The list of films should be specified in array-list.
- 3 Same Practical 6- retrieve data from database
- 4 Design Sign Up form and validate User Name (Minimum 8 character Maximum 15 and only characters and under score), Password (Minimum 8 Characters) and Retype Password (Both should be same), Phone No(Only digits), Email-id etc.
- 5 Develop a web page for a real estate firm that accepts information of flats to be sold such as City, No. of Rooms, Expected Price and stores it in a database. Another web page that shows a combo box containing the list of cities. When you select a city, show the flats available in that city. [Use data binding and data source]. Show advertisements of any 3 popular products/companies.
- 6 Create a web service that displays – (i) NSE Index (ii) BSE Index (iii) Gold Rate, (iv) Petrol Rate (for 4 metro cities) of a particular city which is passed by user.

Mini Project (Compulsory):

Guidelines for Mini Project:

1. Allow **minimum 2 to maximum 3** students per mini project group
2. Take the topic from students in **first 15 days** from the start of the semester.
3. Follow Software Development Life Cycle Phases for mini project development.

Mini Project shall follow the steps below:

1. Requirement Analysis
2. Design
3. Coding
4. Testing
5. Deployment

The report of this Mini project is to be submitted in typed form with Spiral Binding. The report should have all the necessary diagrams, charts, printouts and source code. The work has to be done in groups.

The suggestive format of the report is as follows:

(Only one report should be submitted per group)

Title of the Mini Project:

Names & Roll Nos of the students:

Name of the guide:

Chapter 1: Introduction

Chapter 2: Requirement specifications

Chapter 3: Design and implementation

(This chapter will include the entire design process with necessary DFDs, other diagrams, design methodologies and other design and implementation details.)

Chapter 4: Performance Analysis

(This chapter will include Testing and evaluation process. It should also mention about the method of testing used. It will include test case analysis with results. It should also indicate how better the designed system performs with tabular results.)

Chapter 5: Conclusions (This should include conclusion & future scope)

Practical Examination:

Practical Examination should be conducted by internal examiner for three hours under the supervision of external examiner. External examiner should evaluate student by checking practical performance and conducting viva.

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Third Year Engineering (All Branches)
Semester – I

Course code : BSH331

Title :- Communication skills-II

Teaching Scheme

Practical:- 4 Hours/Week

Examination Scheme

Online Exam :- 50 Marks

Duration of Paper :01 Hours

CONTENTS

UNIT-1

- Fast calculation techniques, Number system, ratio, proportion, variations averages,
- Simple interest, compound interest, profit, loss
- Work and time speed and distance
- Set theory and venn diagram, permutation and combination
- Probability, alphanumeric series, logical deduction, reasoning, coding and decoding and blood relation
- Data interpretation

UNIT-2

- The key components of non verbal communication i.e. eye contacts, body language, vocal tone and volume.
- Team work and team building, The basics of team intelligence, Diversity awareness, Gender issues
- Group discussion, unstructured group discussions and actual group discussions
- Presentation skills, self confidence and decision making

UNIT-3

- Adapting to corporate life
- Phone etiquettes, Email etiquettes, clothing etiquettes, Dining table etiquettes
- Getting ready for an interviews, corporate dressing, writing reports and proposals, minutes writing,

Reference Books:

1. Gopal Swamy Ramesh, Mahadevan Ramesh, "The Ace of soft skills" Pearson publication
2. Bansal Harison, "Spoken English"
3. Orientblackswan, "English for Engineers and Technologist"
4. Jerry Wiessman, "Presenting to Win" Pretince Hall publications
5. William sanborn Pfeiffer, T.V.S, Padamaja, "Technical Communication"
6. M.Tyra, "Magical book on Quikermaths" BSC publishing co.pvt.ltd.

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Third Year Engineering (CSE/IT)
Semester – II

Course Code :CSE351

Title :- Advanced JAVA

Teaching Scheme

Theory: 4 Hours/Week

Examination Scheme

Class Test: 20 Marks

Theory Examination (Marks) :80 Marks

Theory Examination (Duration) :03 Hours

Prerequisite

1. Object oriented Programming in C++.
2. Programming in core JAVA.
3. Basics of Web Technology.

Objectives:

1. Construct a Web Application using Servlets
2. Construct a Web application using Java Server Pages
3. To understand working of Web service
4. Construct an asynchronous enterprise application using Message-Driven Beans
5. Fetch data effectively from database using traditional SQL and Hibernate Query Language

CONTENTS

SECTION-A

UNIT 1:- Client Server Technology

(6 hrs)

- Introduction Single Tier Architecture, Two Tier Architecture, Multi-Tier Architecture
- HTTP protocol: Request and Response, Web Containers, Web Server.
- Overview of J2EE, J2EE Architecture, J2EE Technology.
- Introduction to Ajax, XML HTTP Request & Response.
- Introduction to RMI, RMI Architecture.

UNIT 2:- Servlets Programming.

(08 Hrs)

- Introduction.
- Definition, Servlet Implementation,
- Servlet configuration,
- Servlet Life cycle,
- Servlet Session,
- Context and Collaboration,
- Web Archive Files,
- Deployment Descriptor, Deployment Configuration.

UNIT 3:- Java Server Page.

(06 Hrs)

- JSP: Overview, lifecycle, Architecture.

- JSP Elements: Directives, Scripting, Action tags, Implicit Objects, Comments. Custom Tags
- Scope: page, request, session, JSP Exception handling.

SECTION-B

UNIT 4:- WEB Services, JAVAMAIL

(06 Hrs)

- **WEB Services:** Introduction, Web Service Technologies, and J2EE for web service, developing web services.
- **JAVAMAIL:** Mail Protocols, Components of the Javamail, Sending mail, reading mail, saving and loading mail.

UNIT 5:- HIBERNATE & STRUTS

(08 Hrs)

- **HIBERNATE:** Introduction, Hibernate Architecture, component of Hibernate, Hibernate query Language, Hibernate O/R mapping.
- **STRUTS:** MVC Architecture, Struts framework, working of Struts, Struts controller, action class, Struts validator Framework.

UNIT -: 6 JSF and EJB

(06 Hrs)

- **Java server Faces:** Introduction, JSF architecture, components of JSF, JSF lifecycle, JSF configuration.
- **EJB:** Enterprise bean architecture, Benefits of enterprise bean, types of beans, Accessing beans, packaging beans.

Text/ Reference Books:

1. Subrahmanyam Allamaraju, Samir Tyagi, Karl Avedal, John Griffin, “Professional Java Server Programming”, Wrox Publication.
2. Java Server Programming (Java EE 5) Black Book by Wiley Publication.
3. Sharanam Shah, Vaishali Shah, “Java EE 6 for Beginners”, Shroff Publishers & Distributors Pvt. Ltd.
4. James Holmes, “The Complete Reference Struts”, TataMcGraw Hill.

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks

Dr. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD
FACULTY OF ENGINEERING AND TECHNOLOGY
Third Year Engineering (CSE/IT)
Semester – II

Course Code :CSE352

Title :- Design and Analysis of Algorithm (DAA)

Teaching Scheme

Theory :- 4 Hours/week

Examination Scheme

Class Test: 20 Marks

Theory Examination (Marks) : 80 Marks

Theory Examination (Duration) :03 Hours

Prerequisite

1. Programming in C Language (Covered at FE level).
2. Discrete Mathematical Structure (Covered at SE level).
3. Data Structures (Covered at SE level).

Objectives:

1. The objective of this course is to build a solid foundation of the most important fundamental subject.
2. The objective of this course is to study paradigms and approaches used to analyze and design algorithms and to appreciate the impact of algorithm design in practice.
3. It also ensures that students understand how the worst-case time complexity of an algorithm is computed.
4. How asymptotic notation is used to provide a rough classification of algorithms.
5. How there are still some problems for which it is unknown whether there exist efficient algorithms, and how to design efficient algorithms

CONTENTS

SECTION-A

UNIT 1:- Fundamental concept of algorithm design & analysis.

(8 hrs)

- Algorithm: characteristics, specifications
- Writing Pseudo-Code
- Frequency count and its importance in analysis of an algorithm,
- Asymptotic Notations: Time complexity & Space complexity of an algorithm, Big 'O', ' Θ ' & ' Ω ' notations, Best, Worst and Average case analysis of an algorithm.
- Analysis of searching algorithms: sequential, binary search,
- Analysis of sorting methods: bubble, insertion, selection, heap sort. Analysis of each sorting technique for best, worst and average case, Concept of Internal & External sorting.

UNIT 2:- Divide and conquer algorithmic design method

(6 hrs)

- Divide and conquer: basic algorithm and characteristics.

- Binary Search: method and analysis of binary search for best, worst and average case for searches.
- Quick Sort, Merge Sort : method and analysis of algorithms
- Finding the largest and smallest number in a list using DnC.
- Matrix Multiplication using DnC.

UNIT 3-: Greedy Method

(6 hrs)

- The Greedy Method: basic algorithm and characteristics.
- Fractional Knapsack Problem solving using greedy method.
- Optimal merge patterns and optimal storage on tapes.
- Job sequencing with deadlines.
- Huffman Coding : greedy method
- Minimum cost spanning trees: Prim's and Kruskal's Algorithm
- Single source shortest path

SECTION-B

UNIT 4 - 4.1-: Dynamic Programming Method

(6 hrs)

- Dynamic Programming Method: basic algorithm and characteristics.
- 0/1 Knapsack Problem solving using DP method.
- Multistage graphs
- Optimal binary search trees
- Travelling salesperson problem

Unit 4.2-: Tree traversal and graph traversal techniques

(4 hrs)

- Tree traversal techniques
- Graph traversal techniques :DFS,BFS
- Connected components
- Bi-connected components & spanning trees

UNIT 5-: Backtracking Method

(4 hrs)

- Backtracking Method: basic algorithm and characteristics.
- Solving n-queens problem
- Sum of subsets problem
- Graph colouring
- Hamiltonian cycle (TSP)

UNIT 6-: Branch and Bound technique

(6 hrs)

- Branch and bound: basic algorithm and characteristics.
- Solving n-queens using branch & bound
- FIFO Branch and Bound & Least Cost Branch & Bound
- Least Cost Search
- 15-puzzle
- Solving Travelling salesperson problem using branch & bound

Text Books:

1. Ellis Horowitz, Sarataj Sahni, S.Rajasekaran, “Fundamentals of Computer Algorithms”, Universities Press.
2. Udit Agarwal, “Algorithms, Design and Analysis”, Dhanpat Rai & Co.
3. Hari Mohan Pandey, “Design Analysis and Algorithms”, An imprint of Laxmi Publications Pvt. Ltd.
4. Michael Goodrich, Roberto Tamassia. “Algorithm Design”, Wiley Student Edition

Reference books:

1. Alfred V. Aho, John E. Hopcroft, Jeffrey D. Ullman , “The Design and Analysis of Computer Algorithms”, Addison Wesley
2. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein,” Introduction to algorithms”, MIT Press

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Third Year Engineering (CSE/IT)
Semester – II

Course Code : CSE353

Title :- Software Testing and Quality Assurance (STQA)

Teaching Scheme

Theory :- 4 Hours/week

Examination Scheme

Class Test: 20 Marks

Theory Examination (Marks) : 80 Marks

Theory Examination (Duration) :03 Hours

Prerequisite

Software Engineering (Covered at TE Part I).

Objectives:

1. To identify correctness, completeness and quality of developed Software.
2. To identify the importance of software testing in Software Development Life-Cycle
3. To gain knowledge about various types of software testing.
4. To train students to create good test cases and improve the quality of software
5. To study software testing process and various automated software testing tools.
6. To develop an application and test it using any automated testing tool.

CONTENTS

SECTION-A

UNIT 1:- Introduction to Basic of software testing & Terminology (8 hrs)

- Software Development & Software Testing Life Cycle- role and activities
- Necessity and Objectives of testing
- Quality Concepts, Quality Control, McCall's factor model
- Different Software Development Model
- Object– oriented testing, Web testing, GUI testing.
- Elements of Software quality assurance
- Quality Assurance Activities, Statistical Quality Assurance
- Software Reliability, SQA plan
- Testing Standards:-IEEE, CMM, ANSI

UNIT 2:- Levels of Testing (6 hrs)

- Verification and Validation Model
- Techniques of Verification:-Peer Review, Walkthrough, Inspection, FTR
- Unit testing, Integration testing, Function Testing
- System testing, Installation Testing, Usability Testing, Regression testing,
- Performance testing:-Load Testing, Stress Testing, Security testing, Volume testing
- Acceptance testing:-Alpha testing, Beta testing, Gamma testing.

UNIT 3:- Testing Methods**(6 hrs)**

- Black Box methods:-Equivalence partitioning, Boundary-value analysis, Error guessing, graph-based testing methods, Decision Table Testing.
- White Box methods:-Statement coverage, Decision coverage, Condition coverage, Path testing, Data flow testing.

SECTION-B**UNIT 4:- Testing Tools****(8 hrs)**

- Features of test tool
- Guidelines for selecting a tool
- Tools and skills of tester
- Static testing tools
- Dynamic testing tools
- Advantages and disadvantages of using tools
- Introduction to open source testing tool.

UNIT 5:- Test Planning & Documentation**(8 hrs)**

- Development plan and quality plan objectives
- Testing Strategy:-type of project, type of software.
- Test Management, Strategic Management , Operational Test Management, Managing the Test Team
- Test Plans, Test Case, Test Data,
- Risk Analysis.

UNIT 6:- Defect Management and Test Reporting**(6 hrs)**

- Defect Classification
- Defect Management Process
- Defect Management Tools
- Defect life cycle, Defect Reporting
- Test reporting,Qualitative and quantitative analysis
- Fagan Inspection.

Text Books:

1. M.G.Limaye, “Software testing principles, Techniques and Tools”,TMH
2. Ron Pattern, “Software testing “, Tech Publications
3. Roger Pressman, “Software Engineering- a practitioners approach”, McGraw Hill

Reference Books :

1. Dr. K.V.K.K. Prasad, “Software testing tools”, Dreamtech Publications
2. Rex Black, “Software testing “, Wrox Publications
3. Boris Bezier, “Software testing techniques”, Dreamtech Publications
4. William E. Perry, “Effective Methods for Software Testing” Wiley Pub.

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Third Year Engineering (CSE/IT)
Semester – II

Course Code :CSE354

Title :- Computer Network -II

Teaching Scheme

Theory: 4 Hours/Week

Examination Scheme

Class Test: 20 Marks

Theory Examination (Marks) :80 Marks

Theory Examination (Duration) :03 Hours

Prerequisite:

Data Communication & Networking

Objectives:

1. To understand the Network Architecture.
2. To learn and understand various Networking Protocols & Layers.
3. To design and implement various algorithms for Protocols used in Computer Networks

CONTENTS

SECTION-A

UNIT –1: Network Layer

(8 hours)

- Network Layer Design Issues
- Routing Algorithms
- Internetworking,
- Routing protocols-RIP, OSPF, BGP, IGRP.

UNIT-2: Congestion Control and Quality of Service

(8 hours)

- Data Traffic
- Congestion, congestion control, Congestion control algorithms
- Quality of service, congestion control Techniques to improve QOS
- Integrated Services.
- Differentiated services
- Quality of Service in switched networks.

UNIT- 3: ATM Networks

(4 hours)

- Design goals ,problems architecture ,switching
- ATM layers Congestion control and quality of Service(QOS)
- ATM LANs, LAN architecture, LAN emulation Client server Model,
- Mixed Architecture with client server

SECTION-B

UNIT 4: Transport Layer

(8 hours)

- Process to Process Delivery
- Elements of Transport Protocols,
- User Datagram Protocols (UDP)
- Transmission Control Protocol (TCP),
- Socket Programming (TCP & UDP)
- TCP Services TCP Flow control, TCP Congestion Control,
- Stream Control Transmission Protocol (SCTP).

UNIT 5- : Application Layer

(8 hours)

- Name Space, Domain Name Space, Distribution of name space
- DNS in the Internet
- Resolution DNS messages
- Types of records, Registrars.
- Dynamic Domain name System (DDNS)
- Encapsulation, Remote Logging,
- Electronic mail
- File Transfer.

UNIT-6 : Network Management

(4 hours)

- Network Management System
- Simple network Management Protocols (SNMP)
- Real Time Transport Protocol
- Session Initiation Protocol, H.323.

Text books:

1. Forouzan B, “Data communication and Computer Networks”, 4th Edition, Tata McGraw Hill
2. Andrew S. Tanenbaum, “Computer Networks”, 4th Edition, Pearson Education

Reference Books:

1. William Stallings, “Data and Computer Communication”, 8th Edition, Pearson Education, 2007.
2. Alberto Leon, Garcia and Indra Widjaja “Communication Networks – Fundamental Concepts and Key architectures”, 2nd Edition, Tata McGraw-Hill, 2004.

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FACULTY OF ENGINEERING AND TECHNOLOGY
Third Year Engineering (CSE/IT)
Semester – II

Course Code :CSE355

Title :- Theory of Computation (TOC)

Teaching Scheme

Theory: 4 Hours/Week

Examination Scheme

Class Test: 20 Marks

Theory Examination (Marks) : 80 Marks

Theory Examination (Hours) : 03 Hours

Prerequisite

Discrete Mathematics (Covered at SE level).

Objectives:

1. To study abstract models of computations.
2. To create a background for design of compilers.
3. To be able to apply these models in practice for solving problems in diverse areas such as string searching, pattern matching and language design.

CONTENTS

SECTION-A

UNIT 1: Finite Automata

(8 hrs)

- Introduction to Finite Automata, Structural representation, Automata and complexity.
- Chomsky Classification of languages.
- The Central Concepts of Automata Theory, Deterministic Finite Automata, Nondeterministic Finite automata.
- FA with epsilon transitions.
- Applications of FA, FA with output: Moore and Mealy machine.

UNIT 2: Regular Expressions and Languages

(8 hrs)

- Regular Expressions.
- Finite automata and Regular Expression.
- Algebraic laws for RE, Ardens theorem.
- Pumping lemma of Regular languages, Applications of pumping lemma.
- Closure and Design properties of regular languages.
- Equivalence and minimization of Automata.
- Applications of Regular Expressions.

UNIT 3 : Context Free Grammars and Languages

(4 hrs)

- Context Free Grammars.

- Parse trees.
- Applications of CFG.
- Ambiguity in grammars and languages.

SECTION-B

UNIT 4: Pushdown Automata and LBA

(8 hrs)

- Pushdown Automata – Definition, Languages of PDA.
- Equivalence of PDA's and CFG's (Grammar to PDA and PDA's to Grammars).
- Deterministic Pushdown Automata.
- The model of linear bounded Automata, LBA and Languages.

UNIT 5: Properties of Context Free languages

(4 hrs)

- Properties of Context Free Languages: Normal Forms for CFGs .
- Pumping lemma for CFLs.
- Decision Problems involving context free languages.

UNIT 6: Turing Machine

(8 hrs)

- The Turing machine – Notation for TM, Instantaneous description for TM.
- Transition diagram for TM, The language of a TM.
- TM and halting, Programming techniques for TM.
- Extensions to the basic TM: Multitape TM, Nondeterministic TM, TM and computers, Universal TM.

Text Books:

1. John E. Hopcroft , Rajeev Motwani , Jeffrey D. Ullman, “Introduction to Automata Theory Languages, and Computation” 3rd ed. , Pearson Education, ISBN: 81-317-1429-2
2. K.L.P. Mishra, N. Chandrasekaran, “Theory of Computer Science: Automata, Languages and Computation” 3rd ed. , PHI , ISBN : 978-81-203-2968-3

Reference Books:

1. John C Martin, “Introduction to Languages and the Theory of Computation”, 3rd ed., Tata McGraw Hill, ISBN: 0-07-066048-4
2. Basavaraj S. Anami, Karibasappa K. G. , “ Formal Languages and Automata Theory” Wiley Publication, ISBN : 978-81-265-2010-7

PATTERN OF QUESTION PAPER:

Six units in the syllabus shall be divided in two equal parts i.e. 3 units in each part. Question paper shall be set having two sections A and B. Section A questions shall be set on first part and Section B questions on second part. Question paper should cover the entire syllabus.

For 80 marks Paper:

1. Minimum ten questions
2. Five questions in each section
3. Question no 1 from section A and Question no 6 from section B having weightage of 10 marks each be made compulsory and should have at least eight bits of two marks out of which five to be solved.
4. Two questions from remaining questions from each section A and B be asked to solve each having weightage of 15 marks

Dr. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY, AURANGABAD
FACULTY OF ENGINEERING AND TECHNOLOGY
Third Year Engineering (CSE/IT)
Semester – II

Course Code :CSE371

Title :- LAB-V Advanced JAVA

Teaching Scheme

Practical: 02 Hours/Week

Examination Scheme

Practical /Oral Examination :50 Marks

Practical Exam Duration: 03 Hours

Suggestive List of Experiments:

1. Application development using RMI (develop any one)
 - a. File transfer utility
 - b. Simple mathematical calculator
 - c. Message transfer utility
 - d. Sorting Methods
 - e. Database operations
2. Design a Servlet program to print request header information.
3. Design any one application using Servlet and any database (mySql / Oracle / DB2)
 - a. Admission Form
 - b. Question / answer section
 - c. Simple mark sheet
 - d. Customer Feedback System
4. Design any one application using HTML/Java Script, Ajax, Servlet and any database (mySql/ Oracle / DB2)
 - a. Online test
 - b. Online feedback system
 - c. Online customer support system
 - d. Online university exam form submission
5. Design any one application using HTML/ Java Script, Ajax, Servlet, JSP and any database (mySql / Oracle / DB2)
 - a. online auction system
 - b. online discussion forum
 - c. online student admission application
 - d. Online attendance system
6. Design application program using custom tags
7. Design a mailing system

8. Design and implement web-service
9. Develop a hibernate application to store the feedback of website visitors in database
10. Develop a simple Struts Application
11. Develop a simple Struts Application to Demonstrate E-mail Validator.

Practical Examination:

The term work shall consist of at least 6 experiments/ assignments based on the syllabus above and a group of 2-3 students must develop real time web application.

The Practical Examination shall consist of writing and performing an experiment / assignment and oral based on the syllabus as per the journal record. Duration of examination is three hours.

Practical Examination should be conducted by internal examiner for three hours under the supervision of external examiner. External examiner should evaluate student by checking practical performance and conducting viva.

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Semester – II

Course Code :CSE372

Title :- LAB-VI Design and Analysis Algorithm (DAA)

Teaching Scheme

Practical: 02 Hours/Week

Examination Scheme

Practical /Oral Examination :50 Marks

Practical Exam Duration: 03 Hours

Design, develop and implement the following programs using C or C++ language in LINUX/Windows environment.

List of Experiments:

1. Program to implement Heapsort.
2. Program to implement Binary search using Divide and Conquer.
3. Program for finding the minimum and maximum using Divide and Conquer.
4. Program to implement merge sort using Divide and Conquer.
5. Program to implement Knapsack problem using Greedy method.
6. Program to implement Prims Algorithm using greedy method.
7. Program to implement Kruskal's Algorithm using Greedy method.
8. Program to implement Multistage Graphs using Dynamic Programming.
9. Program to implement All pairs Shortest Path using Dynamic Programming.
10. Program to implement Graph traversal: - Breadth First Traversal.
11. Program to implement Graph traversal: - Depth First Traversal.
12. Program to implement 8- Queens' problem using Backtracking.

Practical Examination:

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Semester – II

Course Code :CSE373

Title :- LAB VII : Software Testing & Quality Assurance

Teaching Scheme

Practical: 2 Hours/Week

Examination Scheme

Term Work : 50 Marks

Tools to be used: The practicals are to be conducted by using the following tools or any other tools of similar nature: Winrunner / Load runner/ Silk test/ QTP / Test Director/ SQA/IBM Rational Functional Tester /Selenium(Open Source)/ Bugzilla(defect tracking tool))

List of Experiments

1. Study of manual and automated Testing
2. Introduction to open source testing tool
3. Recording test in analog and context sensitive mode
4. Synchronizing test
5. Checking GUI Objects
6. Checking Bitmap Objects
7. Creating data driven test
8. Maintaining test script
9. Project (Creating test report in Bugzilla)
10. Developing test cases for a particular task

Term Work:

Term work shall consists of record of the experiments carried out during the course, which should include neat labeled figures and appropriate explanation for the corresponding experiment indicating what is learnt from the experiment. The term work shall consist of at least 10 experiments.

Assessment of term work should be done as follows:

- * Continuous lab assessment: 40 %
- * Actually performing practical in the laboratory: 40 %
- * Oral Examination conducted (internally) at the time of submission: 20%

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Semester – II

Course Code :CSE374

Title :- LAB-VIII Computer Network-II

Teaching Scheme

Practical: 2 Hours/Week

Examination Scheme

Term Work : 50 Marks

List of Suggested Experiments

1. Configuration of network-Assigning IP Addresses, Subnet mask, Default Gateway, Testing Basic Connectivity.
2. Implementation of any two unicast routing algorithms.
3. Implementation of any two multicast routing algorithms.
4. Implementation of any two congestion control algorithms.
5. Implementing Client-Server program using Iterative UDP server.
6. Implementing Client-Server program using Iterative TCP server.
7. Simulation or implementation of DHCP.
8. Simulation or implementation of DNS.
9. Simulation or implementation FTP.
10. Implementation of Chatting Application using Socket Programming.
11. Design an Enterprise Network by using Cisco Packet Tracer Simulator.(Available on Internet for Free Download)
12. Analysis of Enterprise Network using Network Monitoring tool such as Wireshark/ Nagios.

Note: Practical Experiments can be performed using any of the following Languages: C / C++ / Java and any standard simulation tool.

TERM WORK

Term work shall consists of record of the experiments carried out during the course, which should include neat labeled figures and appropriate explanation for the corresponding experiment indicating what is learnt from the experiment. The term work shall consist of at least 10 experiments.

Assessment of term work should be done as follows:

- * Continuous lab assessment: 40 %
- * Actually performing practical in the laboratory: 40 %
- * Oral Examination conducted (internally) at the time of submission: 20%

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Semester – II

Course Code:- CSE375

Title :- LAB IX Software Development Lab - II
(Mobile Application Development for Android)
(College can offer either Android or iPhone)

Teaching Scheme

Theory: 2 Hrs/Week

Practical: 2Hrs/week

Examination Scheme

Practical Oral Examination : 50 Marks

Practical Exam Duration: 03 Hours

Prerequisite

1. Experience in Object Oriented programming language
2. Knowledge in XML format

Objectives:

1. Build your own Android apps
2. Explain the differences between Android™ and other mobile development environments.
3. Understand how Android™ applications work, their life cycle, manifest, Intents, and using external resources
4. Design and develop useful Android™ applications with compelling user interfaces by using, extending, and creating your own layouts and Views and using Menus.
5. Take advantage of Android's APIs for data storage, retrieval, user preferences, files, databases, and content providers
6. Tap into location-based services, geocoder, compass sensors, and create rich map-based applications
7. Utilize the power of background services, threads, and notifications.
8. Use Android's communication APIs for SMS, telephony, network management, and internet resources (HTTP).
9. Secure, tune, package, and deploy Android™ applications

CONTENTS

UNIT -1: 1.1: Introduction to Android

(4 hrs)

- A little Background about mobile technologies
- Android – An Open Platform for Mobile development
- Native Android Application
- Android SDK Features
- Open Handset Alliance
- What does Android run On? Free Additional Benefits Only At WEBCOM
- Why Develop for Mobile?
- Why develop for Android?

- Android Development Framework
- Android Application Architecture
- Android Libraries

1.2: Developing for Android: Your First Android application

- Developing for Android
- First Android application
- Using Eclipse
- Running and Debugging
- Developing for mobile devices
- Android development Tools

1.3: Android Applications and Activities

- Creating Application and Activities
- Application Manifest Introduction
- Android Application Life Cycle
- Application Priority and process states
- Externalizing resources
- Android Application Class
- Android Activities

UNIT -2:2.1:UI Design for Android

(4hrs)

- Fundamental Android UI Design
- Introducing Views
- Introducing Layouts
- Creating new Views
- Draw able Resources
- Resolution and density independence
- Creating and Using menus

2.2: Intents, Broadcast Receivers, Adapters and Internet

- Introducing Intents
- Intents and Intent filters
- What are Pending Intents
- Adapters
- Using Internet Resources
- Introducing Dialogs
- Creating an Earthquake Viewer

2.3: Files, Saving States and Preferences

- Saving Application Data

- Creating and saving preferences
- Retrieving shared preferences
- Creating a settings Activity for an earthquake viewer
- Introducing the preference Activity and preference Framework
- Creating a standard preference activity
- Saving Activity State
- Saving and Loading Files
- Including static files as Resources
- File management tools

UNIT 3:3.1: Database and Content Providers

(4 hrs)

- Introducing Android Databases
- Introducing SQLite
- Cursors and content values
- Working with SQLite Database
- Creating new content Provider
- Using Content providers
- Creating and Using Earthquake content provider
- Native Android Content provider

3.2: Maps, Geocoding , Location Based Services

- Using Location based Services
- Configuring Emulator to test Location based Services
- Updating Locations in Emulator Location Providers
- Selecting a location provider
- Finding your location
- Using proximity Alerts
- Using a geo coder
- Creating Map based Activity
- Mapping Earthquakes Example

3.3: Working in background

- Introducing Services
- Using background Threads
- Let's make a toast
- Introducing Notifications
- Using Alarms

UNIT -4 4.1: Invading the Phone Top

(4 hrs)

- Home Screen widgets
- App widgets

- Earthquake widget example
- Live Folders
- Adding Search to your Application and a quick search box
- Creating Live wallpaper

4.2: Audio, Video, Using Camera

- Playing Audio and Video
- Recording Audio and Video
- Using Camera and taking pictures
- Adding new media to media store
- Raw Audio Manipulation

4.3: Telephony and SMS

- Telephony
- Reading Phone device details
- Reading Sims Details
- Incoming and outgoing call monitoring
- Tracking Service Change
- Introducing SMS and MMS
- Sending SMS and MMS
- Sending SMS messages manually
- Emergency responder

UNIT 5: 5.1: Bluetooth , Network and Wi-Fi

(2 hrs)

- Using Bluetooth
- Managing Network Connectivity
- Managing Wi-Fi

5.2: Sensors

- Using Sensors and Sensor Manager Interpreting sensor values
- Using Compass, Accelerometer and orientation services
- Controlling Device Vibration

UNIT 6: 6.1: Advanced Android Development

(2 hrs)

- Paranoid Android
- Using wake Locks
- Introducing Android Text to speech
- Using AIDL to support IPC for services
- Using Internet Services
- Building Rich User Interface

Text / Reference Books:

1. Hello, Android: Introducing Google's Mobile Development Platform Ed Burnette, Pragmatic Bookshelf (2009)
2. Professional Android Application Development, 2nd Edition Reto Meier, Wrox (2008)
3. Android Application Development All in One for Dummies, Edition I, Barry Burd
4. Teach yourself Android Application Development in 24 hours, Edition I.
5. Mobile Apps Development, Edition I

List of Experiments:

Design, develop and implement the following programs using Java, Android SDK and Eclipse.

1. Introduction to Android, what is Android?
 - Internal development Environment's for Android Development
 - Basic Building Blocks of Android.
 - Android application
2. Developing GUI in Android
 - First Android application (Hello world)
 - Using XML for UI layout
 - Basic widgets
 - Introductions to LinearLayout, RelativeLayout, and TableLayout
3. Android Development Tools
 - Java mode for writing codes
 - DDMS and log results
 - DDMS and simulating calls
 - DDMS and file upload/download
 - DDMS and screenshots
 - Making and using SD card images
 - Debug mode
4. Developing Form Widget Elements and resource
 - TextView, Button, spinner, progress bar, dialogue box
 - composite elements such as expandable listview, gridview
5. Advance GUI Development
 - Using custom layouts in list entries
 - Populating list entries
 - Recycling views
 - Using the holder pattern
6. Developing multiple features on widgets
7. Developing Menus and popup messages using different properties
8. Use the threads in Android application
9. Developing simple Application on Activity Lifecycle.
10. Developing parent activity and accessing child activities developing shared preference application.
11. Developing how to use SQLITE database in applications.

12. Developing media player application and how to use music player in application.

Practical Examination:

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Semester – II

Course Code:- CSE375

Title :- LAB IX Software Development Lab - II
(Mobile Application Development in iPhone)
(College can offer either Android or iPhone)

Teaching Scheme

Lectures: 2 Hrs/Week
Practical: 2Hrs/week

Examination Scheme

Practical Oral Examination : 50 Marks
Practical Exam Duration: 03 Hours

Prerequisite

1. C, C++ Programming
2. PL SQL

Objectives:

1. Be able to download and install the iPhone Software Development Kit
2. Be familiar with the XCode developing environment as it relates to the iPhone
3. Understand iPhone applications design philosophy
4. Understand the Cocoa touch framework
5. Understand iPhone memory management
6. Be able to program simple iPhone applications

UNIT 1:- Fundamental
(2 hrs)

- OOPS
- Software Engineering
- SQL Queries
- Basics of Designing

UNIT 2:- Learning The Language (Objective C)

(4 hrs)

- Data Types
- NSInteger
- NSNumber
- Operators
- Loop
- Intro to .H and .M Files
- Inheritance
- Method Overloading

- Mutable and Immutable Strings
- Mutable and Immutable Arrays
- File Management

UNIT 3-: IPHONE OS

(2 hrs)

- Introduction to Iphone Architecture
- Essential COCOA Touch Classes
- Interface Builder
- Nib File
- COCOA and MVC Framework

UNIT 4 -: Application Development in IPHONE

(6 hrs)

- Controls and Gestures
- Controllers and Memory Management
- Using Application Delegate
- Connecting Outlets
- Managing Application Memory
- Advance Controllers Programming
- Views (Alert View, Table Views, Picker, Date and Time, Image)
- Navigation Based Application Development
- Tab Bar and Tool Bar
- Audio and Video
- Releasing Memory
- Reading PDF File in Iphone Simulator
- Animation and 2-D Graphics
- Email Sending
- XML Parsing
- JSON Parsing
- Web Services Integration

UNIT 5-: DATABASE

(2 hrs)

- SQLite
- Creating Outlets and Actions
- Parsing Data with Sqlite

UNIT 6-: Applicability To Industrial Projects

(4 hrs)

- Project Scope
- Database Dictionary
- Flow Chart
- High Level Requirements
- Location Mapping
- Deployment

- Integration to Web services
- Application Integration
- Launching other Applications

Text/ Reference Books:

1. Joe Conway, Aaron Hillegass. "iPhone Programming THE BIG NERD RANCH GUIDE " , The Big Nerd Ranch Inc.
2. Gary Bennett, Mitch Fisher, Brad Less "Objective-C for Absolute Beginners",. Apress Publication.
3. Neil Smyth "iPhone iOS 5 Development Essentials",.
4. Dan Pilone, Tracey Pilone "Head First iPhone & iPad Development" 2nd Edition , Publisher O'Reilly Media.
5. Rod Strougo, Ray Wenderlich, "Learning Cocos2D: A Hands-On Guide to Building iOS Games with Cocos2D, Box2D, and Chipmunk" Publisher: Addison-Wesley Professional.

List of Experiments:

Design, develop and implement the following programs using iPhone SDK toolkit on MAC OS X.

1. Study of different tools for developing iPhone Application.
2. Introduction to Objective C and Xcode.
3. Introduction to installing Xcode and iOS 5 SDK.
4. Program to display "hello world".
5. Program to create basic controls such as UIButton, UIToolbar, UITextField.
6. Program to create a custom View and using UIScrollView.
7. Program to implement ViewController.
8. Program to implement UITableView and UITableViewController.
9. Program to implement UINavigationController, UIImagePickerController.
10. Program to create iPhone application using SQLite.
11. Creating custom multimedia application for iPhone.

Practical Examination:

Practical Examination should be conducted by internal examiner for three hours under the supervision of external examiner. External examiner should evaluate student by checking practical performance and conducting viva.

Equivalent subjects at TE (CSE) – I & II Pre-revised course to the Revised

SrNo	TECSE Sem-I (Pre-Revised))	Equivalent / Replacement subject
1	Operating System	
2	Software Engineering	
3	Database Management System	
4	Programming in Java	
5	Digital Image Processing	

SrNo	TECSE Sem-I (Pre-Revised))	Equivalent / Replacement subject
1		
2		
3		
4		
5		