SDNB VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)

CHROMEPET CHENNAI 44

SYLLABUS FOR B.Sc COMPUTER SCIENCE .

Title of the Course/ Paper	*PAPER I: - DIGITAL LOGIC FUNDAMENTALS (CSMA)*		
Core	I **Year**	I **Semester**	**Credit: 4**
Course outline	**Unit-1:**	Number Systems & Codes: Number System – Base Conversion – Binary Codes-Code Conversion. Digital Logic: Logic Gates-Truth Tables-Universal Gates.	
	Unit-2:	Boolean Algebra: Laws & Theorems –SOP, POS Methods – Simplification of Boolean Functions – Using Theorems, K-Map, Prime – implicant Method-Implementation using Universal gates. Binary Arithmetic: Binary Addition-Subtraction-Various Representations of Binary Numbers-Arithmetic Building Blocks-Adders-Subtractors.	
	Unit-3:	Combinational Logic: Multiplexers-Demultiplexers-Decoders-Encoders-Code Converters – Parity Generators & Checkers-PAL-PLA.	
	Unit-4:	Sequential Logic: RS, JK, D and T Flip-Flops-Edge-Triggered-Master-Slave Flip Flops. Registers: Shift Registers-Types of Shift Registers.	
	Unit-5:	Counters: Asynchronous Counters Ripple, Mod, Up-Down Counters-Decoding Gates- Synchronous Counters-Ring, Decade, Presettable, Shift Counters. Memory: Basic Terms & Ideas-Magnetic Memories-Memory Addressing- Types of ROMs-Types of RAMs.	
Books for Study:	**1.**	D.P.Leach & A.P.Malvino,Digital Principles and Applications-TMH-Fifth Edition -2002.	
	2.	M.Morris Mano,Digital Logic and Computer Design, PHI, 2001.	
Books for Reference:	**1.**	T.C. Bartee, Digital Computer Fundamentals, 6th Edition, Tata McGraw Hill, 1991.	
	2.	R.J. Tocci, Digital System Principles and Applications, 8th Edition.	

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Title of the Course/ Paper	*PRACTICAL I :– DIGITAL LABORATORY(CSA1)*	
Practical	l **Year** l **Semester**	**Credit: 4**
Exercises	**1)** Verification of truth table for AND, OR, NOT, NAND, NOR and XOR gates. **2)** Realization of NOT, AND, OR, EX-OR gates with only NAND gates. **3)** Realization of NOT, AND, OR, EX-OR gates with only NOR gates. 4) Verification of Associate Law for AND, OR gates. **5)** Karnaugh's Map reduction and logic circuit implementation. 6) Verification of Demorgan's Law. 7) Implementation of Half-Adder and Half-Subtractor. 8) Implementation of Full-Adder and Full Subtractor. 9) Four bit binary Adder. 11) Implementation of shift Registers, Serial Transfer. 12) Ring Counter. 13) 4-bit binary counters	

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Title of the Course/ Paper	PAPER II :- OBJECT ORIENTED PROGRAMMING WITH C++(CSMB)		
Core	I Year II Semester		Credit: 4
Course outline	Unit-1:	Introduction to C++: Principles Of Object Oriented Programming (Oop) – Software Evolution - Oop Paradigm – Basic Concepts Of Oop, Benefits Of Oop – Applications Of Oop.	
	Unit-2:	Tokens, Keywords, Identifiers, Variables, Operators, Manipulators, Expressions and Control Structures in C++; Pointers-Functions in C++ - Main Function-Function Prototyping-Parameters Passing in Functions- Values Return by Functions-Inline Functions-Friend and Virtual Functions.	
	Unit-3:	Classes and Objects - Constructors and Destructors - Operator Overloading - Type Conversions-Type of Constructors-function overloading.	
	Unit-4:	Inheritance: Single Inheritance-Multilevel Inheritance-Multiple Inheritance- Hierarchical Inheritance-Hybrid Inheritance. Pointers, Virtual Functions and Polymorphism; Managing Console I/O operations.	
	Unit-5:	Exception handling, Working with Files: Classes for File Stream Operations-Opening and Closing a File -End-of-File Deduction- File Pointers-Updating a File-Error Handling during File Operations-Command line Arguments.	

Books for Study:	1.	E.Balaguruswamy-Object Oriented Programming With C++-TMH
	2.	Robert Lafore-Object Oriented Programming In Microsoft C++-Galgotia
Books for Reference:	1.	K.R.Venugopal –Mastering C++

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Title of the Course/ Paper	*PRACTICAL II: – C+ + LAB (CSA2)*

Practical	I Year II Semester	Credit: 3
Exercises	**Simple Programs** 1. Generate the pyramid of digits 2. Generate Armstrong numbers upto a specific limit. 3. Generate Fibonacci series upto n (n<50) number **Functions** 1. Write a function for a^n (n is an integer) 2. Add the specific no. of distance values using inline function **Classes and objects** 1. Construct a class for storage of dimensions of circle, triangle and rectangle and calculate their areas. 2. Perform arithmetic operation on complex data using class and object. 3. Enter a date and add or subtract an integer from it depending upon user's choice. **Recursion** 1. Perform Binary search 2. Reversal of a String **Polymorphism** 1. Overload Unary operator 2. Overload Binary operator 3. Overload arithmetic assignment operator 4. Overload operators using friend function 5. Add seconds and time to a specific time value using overloaded functions **Inheritance** 1. Illustrate multilevel inheritance 2. Illustrate multiple inheritance 3. Illustrate multiple inheritance (use virtual base class) **Virtual and Friend Functions** 1. Illustrate runtime polymorphism 2. Multiply two matrices using a friend function **File Handling in C++** 1. Copy a text file to another 2. Create a file of objects and display the objects stored in the file	

DEPARTMENT OF COMPUTER SCIENCE

FIRST SEMESTER

NON MAJOR ELECTIVE FOR OTHER DEPARTMENTS (2 hrs/week)

Objective:

1. To train the students in attending various competitive exams

2. To improve the mental and reasoning ability

3. To enhance logical thinking of the students

Title of the Course/ Paper	*Tests of Analytical Reasoning I (Verbal)* **[From 2013-16 Batch onwards]**		
Non major Elective	I **Year** I **Semester**		**Credit: 2**
Course outline	**Unit-1:**	Questions relating to analogy test, classification, coding and de-coding, classification of ranks	
	Unit-2:	Logic based Venn diagrams, Logical alphabet, number and time sequence test.	
	Unit-3:	Logical arrangement of words, Blood relations, Letter series	

Books for Study:	1.	B.S.Sijwali, Indu Sijwali – A new approach to reasoning, verbal and non-verbal, Arihant Publications Pvt. Ltd.

DEPARTMENT OF COMPUTER SCIENCE

SECOND SEMESTER

NON MAJOR ELECTIVE FOR OTHER DEPARTMENTS (2 hrs/week)

Objective:

1. To train the students in attending various competitive exams

2. To improve the mental and reasoning ability

3. To enhance logical thinking of the students

Title of the Course/ Paper	*Tests of Analytical Reasoning II (Non Verbal)* **[From 2013-16 Batch onwards]**		
Non major Elective	I **Year** II **Semester**		**Credit: 2**
Course outline	**Unit-1:**	Questions relating to Completion of series, Counting of figures	
	Unit-2:	Embedded figure, Analogy	
	Unit-3:	Classification of figures	

Books for Study:	1.	B.S.Sijwali, Indu Sijwali – A new approach to reasoning, verbal and non-verbal, Arihant Publications Pvt. Ltd.

Title of the Course/ Paper	*NON MAJOR ELECTIVE: FUNDAMENTALS OF DATABASE CONCEPTS*	
Non Major Elective	**I Year I Semester**	**Credit: 2**
Course outline	**Unit-1:**	Introduction: File System-DBMS-database system applications-Database system versus file system-Entity-database language
	Unit-2:	Introduction-Starting Access-Using the Database Templates-Creating a Database-Setting a Primary Key-Relationships between Tables-Enforcing Referential integrity-Creating Forms
	Unit-3:	Creating Queries-Using queries to calculate values-Creating an update query-Creating a crosstab query. Creating Reports, Sample application.

Books for Study:	**1.**	"Microsoft Office Access 2007"-Curtis D.Frye

NON MAJOR ELECTIVE EVENING COLLEGE

Title of the Course/ Paper	*NON MAJOR ELECTIVE: BASICS IN QUERY LANGUAGE*	
Non Major Elective	I **Year** II **Semester**	**Credit: 2**
Course outline	**Unit-1:** SQL Introduction: SQL Language-Role of SQL-SQL Features and Benefits DDL-DML-TCL. SQL Basic: Statements-Names-Data types-Constants-Expressions-Built-in- functions.	
	Unit-2: Simple Queries: Select-Where-Insert-Update-Delete -SQL Order By-AND- OR-IN-BETWEEN-Aliases-Union-Create-Drop-Alter-Aggregate Functions-Date Functions-Group By-Select into-Create View-Drop View.	
	Unit-3: Sub Queries: Nested Sub queries-Correlated sub queries-Sub queries in the having clause. Joins: Simple Join-Non Equi join-Inner join-Outer join.	

Books for Study:	**1.**	LEROY, NIRVA MORISSEAV SOLOMON, MARPLAISIR GERALD,P – Oracle 9i SQL programming.

Title of the Course/ Paper	PAPER III: - PROGRAMMING IN JAVA(CSMC)		
Core	II Year III Semester		Credit: 4
Course outline	Unit-1:	Introduction to Java-Features of Java-Object Oriented Concepts- Lexical Issues- data Types- Variables-Arrays-Operators-control Statements.	
	Unit-2:	Classes –Objects-Constructors-Overloading method-Access Control-Static and final methods-Inner Classes-String Class-Inheritance-Overriding methods-Using super Abstract class.	
	Unit-3:	Packages-Access Protection-Importing Packages-Interfaces- Exception Handling Throw and Throws-Thread-Synchronization-Messaging-Runnable Interface-Inter thread Communication-Deadlock- Suspending, Resuming and stopping threads-Multithreading.	
	Unit-4:	I/O Streams-File Streams-Applets-String Objects-String Buffer-Char Array-JavaUtilities -Code Documentation.	
	Unit-5:	**Working with windows using AWT Classes-AWT Controls-Labels-Button-CheckBox-RadioButton-Choice-List-Scrollbars-Layout Managers –Flow Layout-Border Layout-Grid Layout-Card Layout-Grid bag Layout-panels-Frames-Menus-Dialogs-Mouse Events and their Listeners.**	

Books for Study:	1.	Cay S.Horstmann, Gary Cornell-Paper Java 2 Volume I-Fundamentals, 5th Edition. PHI,2000.
	2.	P.Naughton and H.Schildt-Java 2(The Complete Reference)-Third Edition TMH 1999.
	3.	K.Arnold and J.Gosling- The Java Programming Language-Second Edition Addison Wesley, 1996.
Books for Reference:	1.	Programming With Java, A Primer – E..Baluguruswamy
	2.	Programming in Java – C.Muthu

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Title of the Course/ Paper	PRACTICAL III:– JAVA PROGRAMMING LAB(CSA3)	
Practical	II Year III Semester	Credit: 3
Exercises	**Applications** 1. Area and perimeter of the circle 2. Substring removal 3. Program for overloading functions in java 4. Hierarchical inheritance in java 5. Program for overriding 6. Program for abstract class 7. Program for packages and interface. 8. Program for pre-defined exception handling 9. Program for user-defined exception handling 10. Thread and exceptional handling 11. Thread synchronization 12. Program for Inter Thread Communication 13. Program for java utility (calendar class) 14. Program for string manipulation. 15. File Streams	
	Applets 1. Program for applet with mouse listener 2. Frames and controls 3. Menus and dialog box 4. Panel and layout	

Title of the Course/ Paper	PAPER III: - MICROPROCESSORS AND ITS APPLICATIONS(CSMD)		
Core	II **Year**	IV **Semester**	Credit: **4**
Course outline	Unit-1:	Introduction to Micro Computers, Microprocessors and assembly Languages- Microprocessor architecture and its operations- 8085 MPU- 8085 Instruction Set and classifications.	
	Unit-2:	Writing assembly levels programs-Programming techniques such as looping, Counting and indexing addressing modes- Data transfer instructions-Arithmetic And logic operations-Dynamic debugging.	
	Unit-3:	Counters and Time delays-Hexadecimal counter –Modulo 10 counter-Pulse Timings for flashing lights-Debugging counter and time delay program- Stack-subroutine-conditional call and return instructions.	
	Unit-4:	BCD to Binary and Binary to BCD conversions –BCD to HEX and HEX to BCD conversions-ASCII to BCD and BCD to ASCII conversions-BCD to Seven segment LED Code conversions-Binary to ASCII and ASCII to Binary conversions- Multibyte Addition-Multibyte subtraction-BCD Addition-BCD Subtraction-Multiplication and Division.	
	Unit-5:	Interrupt-Implementing interrupts-Multiple interrupt-8085-trap-Problems On implementing 8085 interrupt-DMA-Memory interfaces-Ram & Rom-I/O interface-Direct I/O-Memory mapped I/O.	

Books for Study:	1.	R.S.Gaonkar,"Microprocessor Architecture, Programming and Applications With 8085/8080", Wiley Eastern Limited, 1990.
	2.	A.Mathur,'Introduction to Microprocessor',Third Edition,Tata McGraw-Hill Publishing Co.Ltd., 1993.
Books for Reference:	1.	V.Vijayendran ,Fundamentals of Microprocessor(8085),S. Viswanathan, Printers & Publishers

Title of the Course/ Paper	*PRACTICAL IV :– MICROPROCESSOR LAB(CSA4)*

	2.	Microprocessor(8085) and its Applications - Nagoor kani.A

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Practical	II **Year** IV **Semester**	**Credit: 2**

Exercises	**I Addition and Subtraction**
	1. 8-bit addition
	2. 16-bit addition
	3. 8-bit subtraction
	4. BCD subtraction

Title of the Course/ Paper	*PRACTICAL V: – UNIX AND SHELL PROGRAMMING(CSA5)*

II Multiplication and Division

1. 8-bit multiplication
2. BCD multiplication
3. 8-bit division

Sorting and Searching

1. Searching for an element in an array.
2. Sorting in Ascending order.
3. Finding largest and smallest elements from an array.
4. Reversing array elements.
5. Block move
6. Sorting in descending order.

Code Conversion

1. BCD to Hex and Hex to BCD
2. Binary to ASCII ad ASCII to binary
3. ASCII to BCD and BCD to ASCII

Inheritance

1. Illustrate multilevel inheritance
2. Illustrate multiple inheritance
3. Illustrate multiple inheritance (use virtual base class)

Applications

1. Square of a single byte Hex number
2. Square of a two digit BCD number
3. Square root of a single byte Hex number
4. Square root of a two digit BCD number

Practical	II Year IV Semester	Credit:2

Exercises	1. Write a shell script which receives two file names as arguments. Check whether the file contents are same or not. If same delete the second file.
	2. Write shell script, which gets executed the moment the user logs in, it should display the message GOOD MORNING/GOOD AFTERNOON/GOOD
	a. EVENING depending on the time and user logs in.
	3. Write a function GO which would change the $ prompt to the current directory name in which you are working. Thus if you are working in \usr\acc the prompt should look like \usr\acc.
	4. Write a shell script which displays a) List of all files in the current directory to which you have read, write and execute permissions. b) Receive any number of filenames as arguments and check whether the argument supplied is a file or directory. If it is a directory it should be appropriately reported. If it is a filename then name of the file as well as the number of lines present in it should be reported.
	5. Write a shell script to search a file from the current directory in any of the sub-directories and report the path.
	6. Create a file called TEST, which contains sample data as follows.
	A00001 Shanthi 80 ,A00007 Arun 70 ,S00005 Karthi 50
	Answer the following questions based on the above.
	a. Display the contents of the file sorted according to the marks in the descending order.
	b. Display the names of the students in the alphabetical order ignoring the cases.
	c. Display the list of students who have scored marks between 60 and 80.
	d. Display the list of students and their register number.
	7. Write a shell script to check if the input string is a palindrome.
	8. Write a shell script to accept two file names and check whether both exist. If the second file name exists then the contents of the first file name should be appended to it. If the second file name does not exist then create a new file with the contents of the first file name.
	9. Write a shell script to accept a number in the command line and display the sum up to that number.
	10. Write a shell script to prepare a pay slip.
Books for Study:	1. Unix – The Complete Reference – Kenneth Rosen, Douglas Host, James Farber and Richard Rosinski
Books for Reference	1. Unix Unleashed - Robin Anderson ,Andy Johnston- Fourth Edition

Title of the Course/ Paper	*DATASTRUCTURES AND ALGORITHMS(CSME)*	
Core	III **Year** V **Semester**	**Credit: 4**
Course outline	**Unit-1:**	Definition of a Data Structure-Primitive and composite Data Types, , Arrays, Operations on Arrays, Order lists.
	Unit-2:	Stacks-Application of stacks-Infix to postfix conversion, Recursion, Maze problems-Queues-Operations on Queues, Queue Applications, Circular Queue-Implementation of stack and Queue using C++.
	Unit-3:	Singly Linked List-Operations, Applications-Representation of a polynomial, Polynomial addition; Doubly Linked List-Operations, Applications-Ordering Books in Library(Alphabetical Ordering).
	Unit-4:	Trees and Graphs: Binary Trees-Conversion of Forest to Binary tree, Operations-Tree Traversals; Graphs-Definition, Types of Graphs - Traversal- Shortest Path Dijikstra's Algorithm- Hashing Tables and Hashing Functions .
	Unit-5:	Algorithm-Definition-examples- asymptotic Notations -Complexity-divide and conquer-Binary search- Maximum and Minimum-Merge Sort-Quick Sort-Selection sort.

Books for Study:	1.	E.Horowitz and S. Sahni, Fundamentals of Data Structures in C++, Galgotia Pub. 1999.
	2.	Ellis Horowitz, S. Sahni and S. Rajasekaran - Computer Algorithms **-** Galgotia Pub. Pvt. Ltd., 1998.
Books for Reference:	1.	Schaum's Outline Of Theory And Problems Of Data Structure, Lipschutz Seympur

Title of the Course/ Paper	*PAPER VI: - OPERATING SYSTEMS(CSMF)*		
Core	III **Year** V **Semester**		**Credit: 4**
Course outline	**Unit-1:**	Introduction - System structures-operating system services-user operating system interface-system calls-system programs-Operating system design and implementation--operating –system structure-Virtual Machines–System Boot- Process Management- Process scheduling-operations on processes- Interprocess communication –Communication in client-server systems- Multithreaded programming-overview-multithreading models-thread libraries-Process scheduling-Basic concepts-scheduling criteria-scheduling algorithms-Multiple-Processor scheduling-Algorithm Evaluation	
	Unit-2:	Process Synchronization: Critical-Section Problem-Synchronization Hardware- Semaphores-Classical Problems of Synchronization-Critical Region-Monitors. Deadlocks: Characterization- Methods for Handling Deadlocks-Deadlock Prevention-Avoidance-Detection-Recovery.	
	Unit-3:	Memory Management: Address Binding-Dynamic Loading and Linking-Logical and Physical Address Space-swapping-Contiguous Allocation-Internal & External Fragmentation. Non-Contiguous Allocation: Paging-Implementation-Hardware-Protection-Sharing—structure of page table-Segmentation	
	Unit-4:	Virtual Memory: Demand Paging-Page Replacement-Page Replacement Algorithms-Thrashing. File System: File Concepts-Access Methods-Directory Structures-Protection Consistency Semantics-File System Structures – Allocation Methods-Free Space Management.	
	Unit-5:	I/O System: Overview-I/O Hardware-Application I/O interface-Kernel I/O Subsystem-Transforming I/O Requests to Hardware Operations-Performance. Secondary Storage Structures: Protection-Goals- Domain-Access matrix-The Security Problem-Authentication Threats-Threat Monitoring-Encryption.	

Books for Study:	1.	A.Silberschatz P.B.Galvin,Gange., "Operating System Principless", 7th Edn., John Wiley & Sons., 2002.
Books for Reference:	1.	A.Silberschatz P.B.Galvin,Gange., "Operating System Concepts",6th Edn., John Wiley & Sons., 2002.
	2.	H.M.Deitel,An Introduction to Operating System, Second Edition, Addison Wesley,1990

Title of the Course/ Paper	*PAPER VII: - DATABASE MANAGEMENT SYSTEMS*	
Core	III Year V Semester	Credit: 4
Course outline	Unit-1:	Overview of Database systems:-Managing data-File systems versus DBMS-Advantages of DBMS-Describing and storing data in DBMS-Queries in DBMS-Transaction management-Structure of a DBMS-People who work with DBMS-Introduction to Database Design: Database design and ER diagrams-Entities, Attributes, and Entity sets-Relationships and Relationship sets-Additional features of the ER model-Conceptual design with the ER model
	Unit-2:	Relational Model: Introduction to the Relational model-Integrity constraints over Relations-Enforcing Integrity Constraints-Querying Relational data-Logical Database Design: ER to Relational-Introduction to Views-Destroying/Altering Tables and Views. Relational Algebra: Preliminaries-Relational Algebra. SQL:- Queries, constraints: Overview-The form of a basic SQL query-Union, Intersect and Except-Nested queries-Aggregate operators-Null values-Complex integrity constrains in SQL
	Unit-3:	Schema refinement and Normal forms: Introduction to scheme refinement-Functional dependencies-Reasoning about FDs-Normal forms-Properties of decomposition-Normalization-Schema refinement in database design-Other kinds of dependencies
	Unit-4:	Distributed Databases: Introduction to distributed databases-Distributed DBMS architectures-Storing data in a distributed DBMS-Distributed catalog management-Distributed query processing-Updating distributed data-Distributed transactions-Distributed recovery
	Unit-5:	Object Database Systems: Motivating example-Structured data types-Operations on structured data-Encapsulation and ADTs-Inheritance-Objects, OIDs and Reference types-Database design for an ORDBMS-ORDBMS implementation challenges-OODBMS-Comparing RDBMS,OODBMS and ORDBMS

Books for Study:	1.	Raghu Ramakrishnan / Johannes Gehrke - Database Management Systems- II Edition , TMH
	2.	H. F. Korth and A. Silberschatz - Database System concepts - McGraw Hill International Publication -1998.
Books for Reference:	1.	Date, C, J ,Database Systems, Pearson Education

Title of the Course/ Paper	*ELECTIVE I: - RDBMS WITH ORACLE*		
Elective - I	III **Year** V **Semester**		Credit: 5
Course outline	**Unit-1:**	Database Concepts: A Relational approach: Database – Relationships – DBMS – Relational Data Model – Integrity Rules – Theoretical Relational Languages. Database Design: Data Modeling and Normalization: Data Modeling – Dependency – Database Design – Normal forms – Dependency Diagrams – De normalization – Examples of Normalization.	
	Unit-2:	Oracle9*i*: Overview: Personal Databases – Client/Server Databases – Oracle9i an introduction – SQL *Plus Environment – SQL – Logging into SQL *Plus - SQL *Plus Commands – Errors & Help – Alternate Text Editors - SQL *Plus Worksheet - SQL *Plus. Oracle Tables: DDL: Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.	
	Unit-3:	Working with Table: Data Management and Retrieval: DML – adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – retrieving Data from Table – Arithmetic Operations – restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. Functions and Grouping: Built-in functions –Grouping Data. Multiple Tables: Join – Set operations.	
	Unit-4:	PL/SQL: A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQ L in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions.	
	Unit-5:	PL/SQL Composite Data Types: Records – Tables – Varrays. Named Blocks: Procedures – Functions – Packages –Triggers –Data Dictionary Views.	

Books for Study:	1.	Database Systems Using Oracle – Nilesh Shah, 2nd edition, PHI.
Books for Reference:	1.	Database Managemnet Systems – Arun Majumdar & Pritimoy Bhattacharya, 2007, TMH.
	2.	Database Management Systems – Gerald V. Post, 3rd edition, TMH.

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Title of the Course/ Paper	*ELECTIVE I: - ADVANCED JAVA PROGRAMMING*		
Elective - I	III **Year** V **Semester**		Credit: 5
Course outline	Unit-1:	Servlet overview – the Java web server – your first servlet – servlet chaining – server side includes- Session management – security – HTML forms – using JDBC in servlets – applet to servlet communication.	
	Unit-2:	The software component assembly model – the Java beans development kit – developing beans – notable beans – using infobus – glasgow developments.	
	Unit-3:	EJB architecture- EJB requirements- design and implementation- EJB session beans- EJB entity beans.	
	Unit-4:	EJB clients- deployment- tips,tricks and traps for building distributed and other systems- implementation and future directions of EJB.	
	Unit-5:	Variable in perl – perl control structures and operators – functions and scope.	

Books for Study:	1.	Karl Moss - Java servlets – second edition– Tata McGraw Hill Edition.
	2.	Dustin R.Callaway-Inside Servlets,server side programming for the Java platform- Addison Wesley.
	3.	Joseph O'Neil - Java Beans Programming –TMH.
	4.	PERL: the complete reference 2nd edition – Brown TMH
Books for Reference:	1.	Dustin R.Callaway-Inside Servlets,server side programming for the Java platform- Addison Wesley.
	2.	Cay S Horstmann & Gary Cornell – Core Java – Vol II Advanced Features - Addison Wesley Pvt. Ltd. Indian Branch.

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Title of the Course/ Paper	*ELECTIVE I: - VISUAL PROGRAMMING(ECSA)*		
Elective - I	III **Year** V **Semester**		**Credit: 5**
Course outline	**Unit-1:**	Customizing a Form-Writing Simple Programs-Toolbox-Creating Controls-Name Property-Command Button-Access Keys-Image Controls-Text Boxes- Labels-Message Boxes-Grid-Editing Tools-Variables-Data Types-String Numbers.	
	Unit-2:	Displaying information-Determinate LOOPs-Indeterminate LOOPs-Conditionals-Select case-nested If then- goto. Built-in Functions-Functions and Procedures.	
	Unit-3:	Lists-Arrays-Filter and Split functions-Sorting and Searching-Records-Control Arrays-Combo Boxes- Flex Grid Control-Projects with multiple forms-Do Events and Sub Main-Error Trapping.	
	Unit-4:	VB Objects-Dialog Boxes-Common Controls-Menus-MDI Forms- Testing, Debugging and Optimization.	
	Unit-5:	Monitoring Mouse activity-File system Controls- File System Objects -COM/OLE- automation-DLL Servers-OLE Drag and Drop-Database development using Visual Basic.	

Books for Study:	**1.**	Gary Cornell-Visual Basic 6 from the Ground up-Tata McGraw Hill-1999.
Books for Reference:	1.	Noel Jerke-Visual Basic 6(The Complete Reference)-Tata McGraw Hill-1999.

Title of the Course/ Paper	*ELECTIVE I: VISUAL PROGRAMMING LAB(CSA6)*	
Practical	III **Year** V **Semester**	**Credit: 2**
Exercises	1. Write a program to convert Roman numerals to decimal. 2. Write a program to do money conversion. (conversion of rupees to various currencies) 3. Write a program to design a calculator with arithmetic, sqrt and trigonometric functions. 4. Write a program to perform temperature conversion and inches to feet conversion. The program should include facility to change font size, to display with precision (decimal places). The program should use MDI forms. 5. Write a program to select items from one list and move them to another list. 6. Write a program to implement the timer and shape controls. 7. Write a program to drag the controls within the form 8. Write a program to implement the slider control 9. Write a program to create a sketchpad using picture box. 10. Write a program to create a range tool using user controls. 11. Write a program to implement MSFlexgrid control. For the following programs use Oracle, create a database and perform the operations given below. Use a Menu Driven program: Insertion,(b).Deletion,(c)Modification,(d).Generate simple reports using queries. 1. Telephone directory maintenance. 2. Payroll 3. Electricity bill preparation system 4. Invoice System	

Title of the Course/ Paper	*ELECTIVE I: – ADVANCED JAVA PROGRAMMING LAB*	
Practical	III **Year** V **Semester**	**Credit: 2**
Exercises		

BEANS PROGRAMMING

1. Write a quiz applet and use gauge bean to update the Paper
2. Create a time zone list and retrieve any time which is given with zone using java beans
3. Develop a bean program that display a sequence of images in the form of slide show
4. Create a bean that displays a 3D plot of the following function
   $Z = f(x,y) = 0.01 *(x^2 – y^2)$

5. Create a frame that instantiates the beans registers paints to receive color event notifications from selectors adds the beans to the frame and makes the frame visible
6. Create a bean that displays a pie chart and use pie customizer to update the pie chart
7. Develop a bean that takes date and year and represent it in the local language in the form of a calender For (Eg.) French , Italian etc

SERVLETS PROGRAMMING

1. Write a servlet to display
   a. IP address and Port no. of server
   b. The host name and address of the computer on which your browser visits
2. Use a servlet as RMI client to enable a method given
3. Using servlet create a form which contain a text area, checkbox, radio button, label and text field with buttons
4. Create a chat program that uses servlets to communicate with 2 machines.
5. Create a servlet that gets the date and time of the system

Title of the Course/ Paper	ELECTIVE I: – RDBMS AND ORACLE LAB	
Practical	III **Year** V **Semester**	**Credit: 2**

Exercises	a) Write queries to create the following tables
	i) EMPLOYEE(employee-name, street, city)
	ii) WORKS (employee-name, company-name,salary)
	iii) COMPANY(company-name,city)
	iv) MANAGERS (employee-name, manager-name) Use insert command to add data according to the need of queries.
	b) Find the names of all employees who work for a particular company from the following tables.
	i) EMPLOYEE(employee-name, street, city)
	ii) COMPANY(company-name,city)
	c) Find the names and city of residence of all employee who work for a particular company from the following tables.
	i) EMPLOYEE(employee-name, street, city)
	ii) COMPANY(company-name,city)
	d) Find the names, street address and city of residence of all employees who work for a particular company and earn more than Rs. 2,00,000 per annum. (Nested subquery) from the following tables.
	i) EMPLOYEE(employee-name, street, city)
	ii) WORKS (employee-name, company-name,salary)
	iii) COMPANY(company-name,city)
	e) Find the names of employees who are living in a particular city for a particular company (use group by)
	i) EMPLOYEE(employee-name, street, city)
	ii) WORKS (employee-name, company-name,salary)
	iii) COMPANY(company-name,city)
	f) Find the names of the employees whose salary is greater than the average salary of the particular company (subquery)
	i) EMPLOYEE(employee-name, street, city)
	ii) WORKS (employee-name, company-name,salary)

g) Find the total and average salary of each company employees
   i)   EMPLOYEE(employee-name, street, city)
   ii) WORKS (employee-name, company-name,salary)

h) Find the names of all the employees whose pay is greater than the average pay of their respective company
   i)   EMPLOYEE(employee-name, street, city)
   ii) WORKS (employee-name, company-name,salary)

i) Find the names of the employee and the city they work under a particular manager.
   i)   EMPLOYEE(employee-name, street, city)
   ii) WORKS (employee-name, company-name,salary)
   iii) MANAGERS (employee-name, manager-name)

j) Update the name of an employee who has changed his company. Make proper changes in the following tables.
   i)   EMPLOYEE(employee-name, street, city)
   ii) WORKS (employee-name, company-name,salary)
   iii) COMPANY(company-name,city)
   iv) MANAGERS (employee-name, manager-name)

PL/SQL block

1. Write a PL/SQL program to insert ten values in a table, check each value is odd or even and insert the output into the table
2. Use a cursor to select the five highest paid employees from the emp table.
3. Create a master and a transaction table. Write a Pl/SQL code to update the master using transaction table.
4. Create a package, which consists of two procedures named hire_employee which will insert new employee details into emp table and another procedure named fire_*employee* which will delete an employee details from the database.
5. Write a PL/SQL block that will select all rows from a employee table. The block displays empno, empname, doj, dept, and experience column. Experience column should be calculated using current date and doj column.
6. Write a PL/SQL block to select only those rows where the ordered is 2000 from the item table and update the price to be three times the quantity and set the actual price column of the table to the value in price.

Procedures

1. Create a procedure to calculate simple interest. Principal, rate of interest and no. of years are given as input.
2. Create a procedure to satisfy the following conditions accepting the route id as user input. Create suitable table(s).
   a. If the distance is less than 500 then update the fare to be 190.98
   b. If the distance is between 501-1000 then update fare to be 876.98
   c. If the distance is greater than 1000 then update fare to be 1200.98

Functions

1. Create a function that returns the empno of employees working in admin dept.
2. Create a function that finds out the result of a given student rollno.

Exceptions

1. Write a PL/SQL block to satisfy the following conditions accepting the ticket no as the input. Create suitable table(s).
   a. If the origin is 'madras' then raise an exception to display the origin and ticket no.

   b. If the origin is 'bangalore' then raise an exception to display the origin and ticket no.

2. Write exceptions for the following:

   a. Product_price_history (product_id number(5), product_name varchar2(32), supplier_name varchar2(32), unit_price number(7,2))

   b. Product (product_id number(5), product_name varchar2(32), supplier_name varchar2(32), unit_price number(7,2))

Here product_id is a primary key in product table and a foreign key in Product_price_history table. If we try to delete a product_id from the product table when it has child records in Product_price_history table an exception will be thrown with oracle code number -2292. Provide a name to this exception and handle it in the exception section.

Triggers

1. Write a database trigger before insert/update/delete for each row ant allowing any of the transactions on Mondays, Wednesdays and Fridays. Create suitable table(s)

2. The price of a product changes constantly. It is important to maintain the history of the prices of the products. Create a trigger to update the "Product_price_history" table when the price of the product is updated in the "Product" table. Create the "Product" table and "Product_price_history" table with the following fields respectively

   a.   Product_price_history (product_id number(5), product_name
   varchar2(32), supplier_name varchar2(32), unit_price
   number(7,2))

   b.   Product (product_id number(5), product_name varchar2(32), supplier_name varchar2(32), unit_price number(7,2))

3. Create the Price_history_trigger and execute it.

4. Update the price of a product. Once the update query is executed, the trigger fires and shoud updates the 'Product_price_history' table.

5. Generate a report for railway seat reservations. Check the validity of each field and generate reports for reservation and cancellation details.

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Title of the Course/ Paper	*PRACTICAL VII: – MULTIMEDIA LAB(CSA7)*	
Practical	III Year V Semester	Credit: 2

Exercises	
	FLASH 1. To Move an object 2. To move an object in the path 3. Text flip 4. Creating a link using objects 5. Text color change and Change the color of the object 6. Creating a link using text 7. Shape Tweening 8. Object Animation 9. Drawing Images 10. Change color of the text using buttons 11. Creating links between frames 12. Display date and time 13. Interactive textbox 14. Web Template *ADOBE PHOTOSHOP* 1. Draw custom shape and edit its path and draw a rasterized shape. 2. Using slice tool link an image to some other file. 3. Using blending options try changes with an image. 4. Using the picture package, define pattern, define brush and define custom shape. 5. Using different kinds of photo frame. 6. Apply the filter tools for the surface. 7. Creating a greeting card. 8. Using various text effects. 9. Using various photo effects. 10. Poster designing. 11. Implementing the masking technique. 12. Represent the various techniques for editing images. 13. Design the web page for your department using Photoshop 14. Actions and animations. 15. Logo and visiting card.

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Title of the Course/ Paper	*PAPER VII: - COMPUTER NETWORK(CSMAI)*		
Core	III **Year**	VI **Semester**	**Credit: 4**
Course outline	**Unit-1:**	Introduction - Network Hardware – Software - Reference Models – Internet – ATM - Physical layer - Transmission media - wireless transmission – switching (circuit switching, packet switching, hybrid switching) methods – Communication Satellites.	
	Unit-2:	Data link layer Design issues – error detection and correction – elementary data link protocols – Sliding window protocols – Data link Layer in the Internet.	
	Unit-3:	Medium Access Layer – Channel Allocation Problem – Multiple Access Protocols – Ethernet –Wireless LANs – Blue tooth.	
	Unit-4:	Network layer – design issues – Routing algorithms – Congestion control algorithms – Internet Working – IP protocol – IP Address – Internet Control Protocol.	
	Unit-5:	Transport layer – design issues – Connection management – addressing, Establishing & Releasing A connection – Simple Transport Protocol – Internet Transport Protocol (TCP) – The application layer-DNS-The domain name system-Electronic mail-the World Wide Web-multimedia-Network Security – Cryptography.	

Books for Study:	**1.**	Andrew S.Tannenbaum , Computer Networks , Fourth Edition , - Pearson Education , Inc,(Prentice hall of India Ltd) 2003.
Books for Reference:	**1.**	Behrouz Forouzan – Introduction to Data Communications in Networking, TMH – 1999.
	2.	Fred Halsall , Data Communications , Computer Networks and Open Systems , Addison Wessley.
	3.	D.Bertsekas and R.Gallager , Data Networks , Prenice hall,1992.

Title of the Course/ Paper	ELECTIVE II: - WEB TECHNOLOGY (ECSB)		
Core	III **Year**	VI **Semester**	Credit: 5
Course outline	Unit-1:	Dynamic Content and the Web - PHP and MySQL's Place in Web Development - The components of a PHP Application - Integrating Many Sources of Information - Requesting Data from a Web Page. Developing Locally - working remotely. Exploring PHP-PHP and HTML text - coding building blocks. PHP decision making-Expressions - Operator Concepts - Conditionals-Looping. Functions - calling functions - defining functions- Object-Oriented Programming. Arrays: Array fundamentals. Database basics: Data base design-Structured Query Language.	
	Unit-2:	Using MySQL: MySQL Database - Managing the Database - Backing up and Restoring Data - Advanced SQL. Getting PHP to talk to MySQL: The process-querying the database with PHP functions - Using PEAR. Working with Forms: Building a form - Templates. String functions-Date and time functions - File Manipulation – Calling System Calls - Modifying MySQL objects and PH data: Changing database objects from PHP - Manipulating table data-displaying results with Embedded links- presenting a form to add and process in one file - updating data – deleting data – performing a subquery	
	Unit-3:	Cookies, Sessions and Access Control: Cookies - PHP and HTTP Authentication – sessions - using Auth_HTTP to Authenticate. Security: Session security. Validation and Error handling: Validating user input with JavaScript- Pattern Matching - Redisplaying a form after PHP validation fails. Building a Blog	
	Unit-4:	ASP.NET Language Structure-Page Structure - Page event, Properties & Compiler Directives.HTML server controls- Anchor, Tables, Forms, files. Basic Web server Controls-Label, Textbox, Button, image, Links, Check & Radio button, Hyperlink. Data List Web Server Controls-check box list, Radio button list, Drop down list, List box, Data grid, Repeater-validation controls.	
	Unit-5:	Request and Response Objects, Cookies, Working with Data- OLEDB connection class, command class, transaction class, data Adaptor class, data set class. Advanced Issues-Email, Application Issues, Working with IIS and Page Directives, Error handling. Security-Authentication, IP Address, Secure by SSL Client Certificates.	

Books for Study:	1.	Michele Davis, Jon Phillips-Learning PHP and MySQL-2006 edition, O'Reilly publication
	2.	ASP.NET Developers Guide, Greg Buczek
Books for Reference:	1.	Ellie Quigley , Margo Gargenta- PHP and MySQL by examples
	2.	W.Jason Gilmore -Beginning PHP and MySQL from novice to professional- 3rd edition, Apress publisher
	3.	Vikram Vaswani – PHP programming solutions-2007 edition- Tata McGraw Hill Publication
	4.	ASP.net Complete Reference, Mc Donald, Mathew, TMH

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Title of the Course/ Paper	*PRACTICAL VIII :- WEB TECHNOLOGY LAB II- ASP.NET(CSA8)*	
Practical	III **Year**　　　　　VI **Semester**	**Credit: 2**

Exercises	1. Create an application using ASP.NET to determine whether a number is odd or even
	2. Create an application using ASP.NET to determine whether a number is prime or not
	3. Create an application using ASP.NET to change the type of border style given in a dropdown list box
	4. Create a web form for online quiz. The Marks earned by the user should be displayed back.
	5. Create a web form for an online library. This form must be able to accept the membership Id of the person borrowing a book, the name and ID of the book, and the name of the book's author. On submitting the form, the user (the person borrowing the book) must be thanked and informed of the date when the books is to be returned. You can enhance the look of the page by using various ASP.NET controls. Use proper validation controls.
	6. Create a web form for an online library. This form must be able to accept the membership Id of the person borrowing a book, the name and ID of the book, and the name of the book's author. On submitting the form , the user (the person borrowing the book) must be thanked and informed of the date when the books is to be returned. You can enhance the look of the page by using various ASP.NET controls. Use proper validation controls. Display an advertisement at the bottom of the web from that you created.
	7. Create an array containing the titles of five new movies. Use this array as a data source for a drop down list control. The page must be capable of displaying the selected movies title to the user when the user clicks on the submit button.
	8. Create a web application to generate employee payroll report. The form accepts the employee Id, employee name, basic pay. On submitting the form the allowances and deductions are calculated and displays the respective report. Use proper validation controls.
	9. Use a calendar control in the page to determine the current date (when the book is borrowed) and calculate the due date, which must be one week from the current date. Display the due date to the user.
	10. Create a virtual directory in IIS. Create a global.asa file and include the "session _Start" and "session _End" and, "Application _Begin Request" and "Application_End request" events. Write a simple ASP.NET page and execute it in the browser.

Title of the Course/ Paper	*PRACTICAL IX :- WEB TECHNOLOGY LAB I- PHP & MySQL (CSA9)*	
Practical	III **Year** VI **Semester**	**Credit: 2**
Exercises	1. Write a program in PHP to display date, month and year in a neat format. 2. Write a program in PHP to change background color based on day of the week using if else else if statements and using arrays 3. Write a program in PHP to force the text in a string to be all upper or lowercase 4. Write a program in PHP which writes the given number in words 5. Write a simple program in PHP for i) generating Prime number ii) generate Fibonacci series 6. Write a simple program in PHP to manipulate array values. 7. Write a program in PHP for processing a simple form (use controls like checkbox, radio buttons and options). 8. Write a function in PHP to generate random password 9. Write a program for a simple and fast calendar combining PHP and tables. 10. Write a program in PHP for a simple POST and GET functions. 11. Write a program in PHP for setting and retrieving a cookie 12. Write a program in PHP for exception handling for i) divide by zero ii) checking date format 13. Write a program in PHP for random text link advertising using predefined arrays 14. Write a program in PHP for a simple email processing 15. Write a program for PHP for a login script	

	16. Write a program in PHP for counting lines, number of characters with space and without space from a file
	17. Write a program in PHP to upload file using form control.
	18. Write a program in PHP for storing, retrieving and deleting session data
	19. Write a program in PHP for admin interface to add and delete users using MySQL
	20. Write a program in PHP to add, update and delete using student database.

Title of the Course/ Paper	*ELECTIVE II: - OBJECT ORIENTED ANALYSIS AND DESIGN*	
Elective - II	III **Year** VI **Semester**	**Credit: 5**
Course outline	**Unit-1:** System Development-Object Basics-Development Life Cycle-Methodologies-Patterns-Framework-Unified Approach-UML.	
	Unit-2: Use-Case Models-Object Analysis-Object relations-Attributes-Methods-Class and Object responsibilities-Case Studies.	
	Unit-3: Design Processes-Design Axioms-Class Design-Object Storage-Object Interoperability-Case Studies.	
	Unit-4: User interface Design-View Layer Classes-Micro-Level Processes-View Layer Interface-Case Studies.	
	Unit-5: Quality Assurance Tests-Testing Strategies-Object Orientation on Testing-Test Cases-Test Plans-Continuous Testing-Debugging Principles-System Usability-Measuring User Satisfaction-Case Studies.	

Books for Study:	1.	Ali Bahrami, "Object Oriented System Development", McGraw-Hill International Edition, 1999.
Books for Reference:	1.	Booch G., "Object oriented analysis and design", Addison- Wesley Publishing Company, 1994.
	2.	Rambaugh J, Blaha.M. Premeriani, W., Eddy F and Loresen W., "Object Oriented Modeling and Design", PHI, 1997.

Title of the Course/ Paper	ELECTIVE II: - SOFTWARE ENGINEERING		
Elective - II	III **Year**	VI **Semester**	**Credit: 5**
Course outline	**Unit-1:**	Introduction to Software Engineering: The Software process: A generic view of process-Software Engineering –Layered technology,Process framework,CMMI ,Process patterns , Process assessment , Personal and Team process models ,Process technology and Product&Process. Process models :Waterfall model,Incremental process models,Evolutionary models,Specialised Process models,Unified process.-UML.	
	Unit-2:	Software Engineering: System engineering –computer based systems,System Engineering hierarchy, business process engineering ,Product engineering ,system modeling.Requirements Engineering-Bridge to design and construction,Requirements Engineering tasks,Initiating the requirements engineering process,Eliciting Requirements ,Developing Usecases,Builiding the analysis model ,Negotiating Requirements and Validating Requirements.	
	Unit-3:	Software Engineering: Building the analysis model – Requirement analysis ,Analysis modeling approaches , Data Modeling concepts, Object oriented analysis , Scenario based modeling , Flow oriented modeling ,class based modeling ,Creating Behavioral model. Design Engineering :Design within the context of software Engineering ,Design process and design quality,Design concepts , Design model , Pattern Based Software design.	
	Unit-4:	Modeling component level design: What is a component , Defining class based components, conducting component level design ,object constraint language,Designing Conventional components. Performing user interface design: Golden rules, user interface analysis and design ,interface analysis ,interface design steps and design evaluation.	
	Unit-5:	Testing strategies: A strategic approach to software testing , strategic issues Test strategy for conventional software, testing strategies for object oriented software, validation testing , system testing and art of debugging. Testing tactics: software testing fundamentals, black box testing , White box testing ,Basis path testing , Control structure testing.	

Books for Study:	**1.**	Roger .S. Pressman ,Software Engineering – A Practitioner's Approach : McGraw – Hill International Edition , Sixth Edition.
	2.	K.K. Aggarwal & Yogesh Singh, Software Engineering, New Age International publishers.
Books for Reference:	**1.**	Ian Sommerville, Software Engineering-Pearson Education, Asia -3rd Edition
	2.	Software Engineering-Richard Fairely

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Title of the Course/ Paper	*ELECTIVE II: - SOFTWARE TESTING(ECSC)*		
Elective - II	III **Year** VI **Semester**		**Credit: 5**
Course outline	**Unit-1:**	Principles of Testing – Software Development Life Cycle Models.	
	Unit-2:	White Box Testing – Black Box testing – Integration Testing.	
	Unit-3:	System and Acceptance Testing – Performance Testing –Regression Testing.	
	Unit-4:	Testing Object – Oriented Systems – Usability and Accessibility Testing Organization structures for Testing Teams.	
	Unit-5:	Test Planning, Management, Execution, and Reporting – Software Test Automation – Test Metrics and Measurements.	

Books for Study:	**1.**	Software Testing Principles and Practices, Srinivasan Desikan & Ramesh Gopalswamy, Pearson Education
Books for Reference:	**1.**	Software Testing Technique-Beizer Boris, Dreamtech

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Title of the Course/ Paper	PROJECT: - MINIPROJECT (CSP)		
Elective - III	III Year VI Semester		Credit: 6
Group Projects			
Project Evaluation: Power point presentation of the project and individual viva			

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S. No.	COURSE TITLE	Credits
1.	COMPUTING SKILLS -Technical Writing	3

Title of the Course/ Paper	*Computing Skills – Technical Writing[From 2010-2013 onwards] -SSE4*		
	III **Year** V **Semester**		**Credit: 3**
Course outline	**Unit-1:**	Latex basic: what is Tex?-What is LaTex?-How LaTex works- The LaTex input file-Entering Latex commands-Entering Text-Special Characters-Structure of the Input File. Creating a LaTex Document-Document classes-Class options-Packages-Making a Title Page-Making a Table of Contents.	
	Unit-2:	Document Layout:-Line spacing-paragraphs-text justification-margins-headers, footers, and Page Numbering. Within the Text: Section Headings-Changing Type Style and Size-Starting New Lines and New Pages-Leaving Horizontal and Vertical Space-Drawing Rules- Footnotes-Centering-Quotations.	
	Unit-3:	Tabular Material-Tabbing-Tabular. Mathematics: In-line Math-Display math-Equation Environment-Eqnarrray Environment-Array Environment-Building Mathematical Expressions. Including Graphics: Creating the Graphics File-Importing the Graphic into your LaTex Document-Viewing the Output. Placing Figures and Tables (Floats):-Making a Caption-Overcoming Problems with Float Placement-Landscape Figures and Tables.	

Title of the Course/ Paper	*Computing Skills –Quantitative Aptitude*		
	III **Year** V **Semester**		**Credit: 3**
Course outline	**Unit-1:**	Time and Work - Time and Distance – Profit & Loss	
	Unit-2:	Odd man out and series – reasoning – Analytical – Numerical	
	Unit-3:	Ratio & Proportion – Partnership – Chain Rule	
	Unit-4:	Calendar – Clock – Problems on Numbers – Problems on Age	
	Unit 5:	Data Interpretation – Tabulation – Bar graphs – Pie charts- Line graphs	

Books for Study:	**1.**	Quantitative Aptitude by Dr. R.S.AGGARWAL

General Structure for B.Sc

- CA – Continuous assessment   ESE – End semester examination

Subject	No. of Papers	CA*/paper	ESE*	Maxm. Marks	No. of Credits per Paper	Exam Duration In hrs.	Total No. of Credits	No. of Teaching hours per Paper/sem.
Tamil	4	25	75	100	3	3	12	90
Eng.	4	25	75	100	3	3	12	90
Major Theory	2	25	75	100	4	3	8	90
Major Prac	2	-	100	100	4	3	8	45
Allied Thoery	2	25	100	100	4	3	8	135
Allied Prac								
Total							40	450