

NEP 2020 Syllabus

Computer Application

(Non-major)

(Arts/Science/ Commerce)

Paper Name: FUNDAMENTALS OF COMPUTER AND PROGRAMMING

1. Learning Outcome:

- Student will able to learn about basics of computer system, which includes both the concept of computer hardware and software.
- Student will able to learn about what is programming language, how to design an algorithm to solve a particular problem
- Student will able to learn about C programming language.

2. Prerequisite: NIL

3. Semester: 1

4. Course Type: Compulsory

5. Course Level: 100-199

6. Theory Credit: 3

7. Practical Credit: 1

8. Number of required hours:

- a) Theory: 45 hrs
- b) Practical: 30 hrs
- c) Non Contact: 5 hrs

9. List of reference books

- [1] Anita Goel, *Computer Fundamentals*, Pearson.
- [2] *Comdex: Hardware and Networking Course Kit*, Dream Tech Press.
- [3] V. Rajaraman, Neeharika Adabala, *Fundamentals of Computers*, PHI.
- [4] Ron Gilster, *PC hardware: A beginners Guide*, Tata McGraw Hill.
- [5] E. Balaguruswamy, *Computer Fundamentals and C Programming*, Tata McGraw Hill.
- [6] B.S. Gottfried, *Programming with C*, Tata McGraw Hill.
- [7] B.W. Kernighan, D.M. Ritchie, *The C Programming Language*, PHI.

10. Detailed Syllabus

Unit no.	Unit content	No.of classes
1	Basics of Computer System Evolution of Computer System, Classification of Computer, Modern Computer, Hardware and Software, Major components of a computer (A brief introduction of CPU, Main Memory, I/O units), Keyboard, Display, Mouse, Printers etc, Secondary Storage Devices (Hard Disks, Optical Disks, Flash Memory), Cache Memory and Virtual Memory concepts, Backup Devices, SMPS, BIOS, Processor,	7

	Motherboard, Sockets and Slots, Power Connectors, Peripheral Connectors. Bus Slots, USB, Pin Connectors, Network Interface Card, Network Cabling, I/O Box, Switches, RJ 45 Connectors, Patch Panel, Patch Cord, Racks, Evolution of OS, Types of OS, Functions of OS.	
2	Hard Disk Drive Logical Structure and File System, FAT, NTFS. Hard Disk Tools: Disk Cleanup, Error Checking, Defragmentation, Scanning for Virus, Formatting, Installing Additional HDD, New trends in HDD, Optical Media, CDROM, Theory of Operation, Drive Speed, Buffer, CD-R, CD-RW, DVD ROM, DVD Technology, Preventive Maintenance for DVD and CD Drives, Driver Installation, Writing-Cleaning CD and DVD.	5
3	Number System Representation of Numbers and Characters in Computer, Binary, Hexadecimal, Octal, BCD, ASCII, EDCDIC and Gray codes, Conversion of Bases, Representation of Signed Integers, Sign and Magnitude, 1's Complement and 2's Complement Representation, Arithmetic Operations using 2's Complement Representation, Conditions for Overflow/Underflow and Its Detection.	7
4	Concept of Algorithm Programming Language, Bootstrapping, Assembler, Compiler, Interpreter, Linker and Loader, Definition and Concept of Algorithm and Flow Chart, Writing Simple Algorithms and Drawing Flow Charts for Simple Problems like Finding Sum, Max, Min, Average of a List of Numbers etc.	6
5	Introduction to C Programming (20 Lectures) Elementary Data Types, Variables, Constants, Identifiers and Reserved Word, Constant Data Types, Syntax and Semantics, Variable Declarations, Initialization of Variable during Declarations, Scope and Lifetime of Variables, Operand, Operators in C: Definition of Unary, Binary and Ternary Operators, Arithmetic Operators, Assignment Operators, Relational Operators, Logical Operators and Bitwise Operators, Precedence and Associativity of C Operators, Expression in C, L-value and R-value, Side Effects of Operators, Cast and sizeof Operator, Type Conversion.	20

	<p>Expression Statement, Conditional Statement: if, if-else, switch, Iterative Statement: while, do-while, for, Other Statement: break, continue, goto, return, null Statement, block Statement.</p> <p>Definition and Declaration of Array, Accessing Elements in One Dimensional and Two Dimensional Arrays</p> <p>Function Declaration, Function Declaration and Definition, Calling a Function, Parameters Passing Methods: Call by Value and Call by Address, Recursive Function.</p> <p>Basic Concept of Strings, Pointer and Structure in C, Different Storage Classes, Basic Concept of Files in C</p>	
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Practical Part

Part A: Computer Fundamentals

(5 Classes/10 hours)

1. Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.
2. Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva.
3. Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.
4. Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva
5. Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Part B: Programming in C

(10 Classes/20 hours)

(This is a suggestive list only. Questions are not limited to this list)

6. Write a program to display ASCII value of a character.
7. Write a program to check whether a number is perfect or not.
8. Write a program to find out the biggest of three numbers using nested if.

9. Write a program to read a list of positive integers terminated by -1 and display the odd and even numbers separately and also their respective counts.
 10. Write a program to read values of n and x and print the value of y using switch case where
 - i. $y=n+x$ when $n=1$
 - ii. $y=1+x/n$ when $n=2$
 - iii. $y=n+3x$ when $n=3$
 - iv. $y=1+nx$ when $n>3$ or $n<1$.
 11. Write a program to find out minimum, maximum, sum and average of n numbers without using array.
 12. Write a program to find out minimum, maximum, sum and average of n numbers using array.
 13. Write a program to display the prime numbers within a given range.
 14. Write a program to print the digits of a number in words. (e.g. if a number 841 is entered through the keyboard, your program should print “Eight Four One”.)
 15. Write a program to read n numbers in a sorted array and insert a given element in a particular position.
 16. Write functions to compute the factorial of a number using both recursive and non-recursive procedure.
 17. Write a program to display the first n Fibonacci numbers using both recursive and non-recursive procedure.
 18. Write a function to check whether a given integer is prime or not and use it.
 19. Write a program to multiply two matrices using function.
 20. Write a program to read a m x n matrix and calculate the Row sum and Column sum of the matrix.
 21. Write a program to concatenate two strings using function (without using library function).
 22. Write a program to convert a string from upper case to lower case and vice versa.
 23. Write a program to swap two numbers using function (pass the pointers).
 24. Declare a structure of a student with details like roll number, student name and total marks. Using this, declare an array with 50 elements. Write a program to read details of n students and print the list of students who have scored 75 marks and above.
- Write a program to copy a text file to another file.

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Paper Name: DATABASE MANAGEMENT SYSTEM

1. Learning Outcome:

- Learn database concepts and its architectural components.
- Describe different data models used for designing a database.
- To create a database using relational models and entity relationships concepts
- Normalize a database into various normal forms
- Design SQL queries to handle a relational database.

2. Prerequisite: NIL

3. Semester: II

4. Course Type: Compulsory

5. Course Level: 100-199

6. Theory Credit: 3

7. Practical Credit: 1

8. Number of required hours:

- d) Theory: 45 hrs
- e) Practical: 30 hrs
- f) Non Contact: 5 hrs

9. List of reference books

- a) Dr. Satinder Bal Gupta and Aditya Mittal, *Introduction to Database Management System*, University Science Press
- b) A. Silberschatz, H.F. Korth, S. Sudarshan, *Database System Concepts*, McGraw Hill
- c) R. Elmasri, S.B. Navathe, *Fundamentals of Database Systems*, Pearson Education
- d) Dr. Rajive Chopra, *Database Management System (DBMS): A Practical Approach*, S. Chand Publication

10. Detailed Syllabus

Unit no.	Unit content	No.of classes
1	Introduction to Database Management Systems Data and Information, Concepts of Fields, Records and Files, Definition of DBMS, Traditional File approach, Traditional file approach versus database management system approach, Disadvantages of Traditional File System, Need of a DBMS, Components of a DBMS, Advantages of DBMS, Disadvantages of Database Systems, Various uses of database System Applications, Database Users: <i>end users or naive users, Online users, Application Programmers, Database Administrator(DBA)</i> , Responsibilities of DBA	7
2	Database Management System Architecture	4

	Data Independence and Three-tier architecture of DBMS, basic concept of data model, Database Languages (Data Definition Languages, Data Manipulation Languages),	
3	E-R Model Entity, Strong and weak entities, Entity Sets, Attributes, various attribute types: <i>Simple and Composite Attributes, Single Valued and Multi-valued Attributes, Derived Attributes and Stored Attributes</i> , Domain of an attribute, Concept of Relationship, Types of Relationship: One-to-One, One-to-Many, Many-to-One and Many-to-Many, Various Symbols used in ER Diagram, Mapping constraints: <i>Mapping Cardinalities and Participation Constraints</i> in ER diagram	7
4	Relational Model Database Schema, sub schema and Instances, Attributes, Attribute domains, Relations, Tuples, Relational Schema, Column, Properties of Relations, Degree of a Relation, Constraints in Relational Model: <i>Domain Constraints, Key Integrity, Referential Integrity</i> . Keys: Primary keys, Foreign keys, Candidate Keys, Super Keys, Alternative Keys, Advantages of relational model	8
5	Normalization for Relational Databases Definition of Functional Dependency, Armstrong's Axioms in Functional Dependency, Types of Functional Dependency: <i>Partial Dependency, Full Functional Dependency, Transitive and Non-transitive Functional Dependency</i> , anomalies In relational database: <i>Insertion, Deletion and Update anomalies</i> , Concepts of Normalization, benefits of Normalization, Types of Normal Forms: First Normal Form (1NF), Second Normal Form (2NF), Third Normal Form (3NF) and Boyce–Codd Normal Form (BCNF)	7
6	SQL queries Characteristics of SQL, Basic data types in SQL, Data-definition language (DDL) commands: <i>Create Database, Create Table, Drop Table, Alter Table</i> . SQL Constraints: <i>Primary Key, Foreign Key, Not Null, Unique, Check, Default</i> . Data Manipulation Language (DML) commands: <i>Insert Into, Delete, Select, Update</i> . SQL clauses: <i>Where, Order By, Having, Group By and Like</i> . SQL join operations: <i>Inner Join, Left Outer Join, Right Outer Join and Full Join</i> . SQL aggregate functions: <i>sum(), count(), max(), min() and avg()</i>	12

1. Lab Content

Practical / Lab work to be performed:

Lab No	Topics to be of the Laboratory work	No of contact Classes (1 Class=2 hours)
1	Implementation of SQL DDL statements in MySQL DBMS: CREATE DATABASE, CREATE TABLE, ALTER TABLE, RENAME, DROP DATABASE/TABLE	3

2	Use of SQL DML statements in MySQL DBMS: INSERT, SELECT, UPDATE, DELETE SQL commands	3
3	Implementing following constraints in MySQL DBMS: PRIMARY KEY, FOREIGN KEY, NOT NULL, UNIQUE and DEFAULT	3
4	Handling following SQL clauses in MySQL DBMS: WHERE, GROUP BY, ORDER BY, HAVING, IN, BETWEEN, LIKE	3
5	Working with following aggregate functions in MySQL DBMS: COUNT, AVG, MAX, MIN and SUM	3
	Total Contact Classes:	15

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Paper Name: BASIC OF OPERATING SYSTEM AND NETWORKING

1. Learning Outcome:

- To give students the role of operating system in computer.
- To provide students the concept of process management
- To familiarize students with the concept of Networking
- To provide the practical concept of OS and Networking..

2. Prerequisite: NIL

3. Semester: III

4. Course Type: Compulsory

5. Course Level: 100-199

6. Theory Credit: 3

7. Practical Credit: 1

8. Number of required hours:

- g) Theory: 45 hrs
- h) Practical: 30 hrs
- i) Non Contact: 5 hrs

9. List of reference books

- (a) Operating System Concepts, Abraham Silberschatz, Peter B. Galvin, Greg Gagne, Wiley
- (b) Data Communications and Networking, Behrouz A. Forouzan, Sophia Chung Fegan, McGraw-Hill,
- (c) Operating Systems: Internals and Design Principles, William Stallings, Pearson
- (d) Computer Networks, Andrew Stuart Tanenbaum, Pearson Education

10. Detailed Syllabus

Unit no.	Unit content	No.of classes
1	Introduction to Operating System Types of software, application software, system software, operating system, types of operating systems, operating system structure, system calls, protection and security, history and generations of operating system, Open source operating systems	5
2	Process and Memory Management Process, process states, process scheduling algorithms, scheduling criteria, turn around time, waiting time, response time, First Come First	14

	Serve (FCFS) scheduling, Shortest-Job-First (SJF) Scheduling, Shortest Remaining Time First scheduling, Priority Scheduling, Round Robin Scheduling, thread, deadlock, memory mnagement, swapping, contiguous memory allocation, first fit strategy, best fit strategy, worst fit strategy, paging, segmentation, page replacement algorithms, internal fragmentation, external fragmentation, virtual memory, demand paging	
3	Networking Introduction Computer network, network topologies, LAN and WAN, internet, network models: ISO OSI, TCP/IP, protocols and standards, transmission media: guided and unguided transmission media, twisted pair cable, co-axial cable, fiber optic cable, radio waves, micro waves, infrared	5
4	Networking concepts Analog and digital signal, error detetion and correction, Ipv4 addressing, dotted decimal notation, classful addressing, classless addressing, Ipv6 addresses, routing protocols, distance vector routing protocol, link state routing protocol, physical address, ARP, RARP, ports, sockets, frames and packets, TCP and UDP protocols, hub, repeater, bridge, router, gateway	14
5	Internet and services Internet, ISP, types of ISPs, WWW, web server, web client, HTTP, HTTPS, web browsers, domain name, URL, DNS, hierarchy of name servers, root servers, primary and secondary servers, telnet, electronic mail, e-mail architecture, SMTP, POP, IMAP, FTP	7

(b) Practical

1. Installation of Windows operating system 2 classes
2. Commands in windows: cd, mkdir, ren, assoc, attrib, mv, cp, cls, del, dir, rmdir etc. 1 class
3. Installation of Linux operating system 2 classes
4. Commands in linux: ls, mkdir, cd, touch, pwd, chmod, cat, echo, su, rm, mv, cp, locate, ps, top, man etc. 3 classes
5. Installing open source software in linux 3 classes
6. Networking commands and tools in windows: ipconfig, nslookup, ping, netstat, arp, tracert, getmac etc. 2 classes
7. Networking commands and tools in linux: ifconfig, ip, traceroute, tracepath, ping, netstat, ss,

dig, nslookup, arp, hostname, whois etc.

2 classes

8. How to fix a slow computer

2 class

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Paper Name: INTERNET AND WEB TECHNOLOGIES

1. Learning Outcome:

At the end of the course, students will be able to

- Understand the concept of Internet and the World Wide Web
- Understand the basic concept of web applications and web services.
- Design basic well-structured web page using HTML and CSS

2. Prerequisite: NIL

3. Semester: IV

4. Course Type: Compulsory

5. Course Level: 100-199

6. Theory Credit: 3

7. Practical Credit: 1

8. Number of required hours:

- j) Theory: 45 hrs
- k) Practical: 30 hrs
- l) Non Contact: 5 hrs

9. List of reference books

- a) Deitel, P. (2021) 5th ed. Internet and World Wide Web How to Program. Pearson.
- b) Jackson J.C. (2007). Web Technologies: A Computer Science Perspective. Pearson.
- c) Duckett, J. (2011). HTML and CSS: Design and Build Websites. John Wiley & Sons.
- d) Robbins, J. N. (2018). Learning Web Design: A Beginner's Guide. O'Reilly Media.

10. Detailed Syllabus

Unit no.	Unit content	No.of classes
1	Computer Networks and the Internet Concepts of the Internet and its evolution. Review of Networking basics – LANs and WANS, Network topologies, protocols and layers. Different networking devices – End devices, Hub, Switch, Router, Server. Brief concept of Internet Protocol and addressing. Concept of DNS and NAT – their role in the Internet. Proxy and VPN. Browsers and their add-ons. Brief concept of Cloud Computing and CDN.	8
2	Introduction to Web Technologies Concept of World Wide Web (WWW), Overview of web browsers and their functionalities. Client-Server Architecture in Web Applications. Communication Protocols – HTTP, HTTPS, FTP. URI and URL. Request Response cycle. Working of DNS. Brief concepts of port, cache and cookies. Introduction to Web Hosting and control panels.	8

3	<p>Front End Development using HTML</p> <p>Website and Webpage. Basic concept of Markup Language. Introduction to HTML. Basic HTML structure. Text formatting Tags – headings, paragraph, line break, horizontal rule. Link and Navigation – anchor tags. Lists - ordered, unordered, definition list. Image and multimedia tags. Tables in HTML. Forms and Input types – text, email, password, radio, select, checkbox, textarea, date, url, submit, button. Brief concept of Semantic HTML – header, nav, main, section, article, aside, footer.</p>	10
4	<p>Front End Design using CSS</p> <p>Introduction to CSS. CSS syntax and rule structure. Inline, Internal and External CSS. CSS selectors – element, class, ID, attribute. Understanding the CSS Box Model – content, padding, border, margin. CSS colours and backgrounds – background-color, background-image, background-repeat. CSS typography – font properties, text properties.</p>	9
5	<p>XML and Client-Server Computing</p> <p>Basics of SGML. Understanding DTD and its role in validating markup languages. Introduction to XML. Creating XML DTDs. Concept of Client-Server Computing. 2-tier, 3-tier architecture. Fat client vs Fat server. Overview of CGI and JSP. Brief concept of JavaScript.</p>	5
6	<p>Web Security</p> <p>Understanding network security and Firewalls. Proxy Servers and their role in caching and security. Common web security vulnerabilities – XSS, SQL injection. Brief concept of SSL/TLS and HTTPS for secure communication.</p>	5

List of Practical

30 hours

(This is a suggestive list only. Questions need not be restricted to this list.)

1. Create a basic HTML webpage structure with a heading, paragraph, and an image.
2. Build a navigation menu using an unordered list () with clickable links.
3. Create a multi-level list of items.
4. Implement a form with input fields for name, email, and a submit button.
5. Create a table with multiple rows and columns to display tabular data.
6. Design an image gallery using HTML and CSS.
7. Implement an ordered list () to display a step-by-step tutorial or instructions.
8. Create a dropdown select menu (<select>) with multiple options.
9. Use HTML5 semantic tags (such as <header>, <nav>, <section>, <article>, <footer>) to structure and organize content on a webpage.

10. Build a registration form with fields for name, email, password, date of birth, address and other such fields with a submit button. Include appropriate input types, labels and placeholders.
11. Style a heading element with a custom font, colour and background.
12. Apply different background colors to alternate rows in a table.
13. Implement a hover effect on a button that changes its background colour or adds a solid border.
14. Style a form input field with custom border, padding, and background color.
15. Build a form with input fields for name and email. Design the form with CSS. Use an alert to display a success message when the form is submitted successfully, otherwise show an error alert. Use JavaScript for the validation.
16. Create a simple web portfolio having the details of a candidate. Use proper HTML elements and apply styles using CSS.

Particulars of Course Designer:

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Paper Name: PYTHON PROGRAMMING

1. Learning Outcome:

At the end of the course, students will be able to

- Understand the basic problem solving techniques using Python which helps in research and commercial application development.
- After completing this course, students will know about fundamentals of Python Programming and Problem Solving.

2. Prerequisite: Basic programming concept

3. Semester: V

4. Course Type: Compulsory

5. Course Level: 100-199

6. Theory Credit: 3

7. Practical Credit: 1

8. Number of required hours:

- m) Theory: 45 hrs
- n) Practical: 30 hrs
- o) Non Contact: 5 hrs

9. List of reference books

- (a) **Core Python Programming**, R. Nageswara Rao, Dreamtech Press.
- (b) **Python: The Complete Reference**, Martin C. Brown, McGraw Hill Education.
- (c) <http://docs.python.org/3/tutorial/index.html>

10. Detailed Syllabus

Unit no.	Unit content	No.of classes
1	Introduction to Python Programming Introduction, Installation of Python Interpreter, Python Shell, Code Indentation, Identifiers and Keywords, Literals, Strings, Operators (Arithmetic, Relational, Logical, Assignment, Ternary, Bitwise, Increment and Decrement Operators), Input and output statements, Output Formatting.	7
2	Control Statements and Functions Branching, Looping, Conditional Statement, Exit Functions, Break, Continue, Pass, Defining Functions, Default Arguments. Scope of	7

	Functions, Function Documentation, Lambda Functions & Map.	
3	Python Data Structures List (List, Nested List, List as Matrix), Tuple, Set, Dictionary.	5
4	Exception Handling Errors, Exception Handling with try, Multiple Exception Handling, Writing own Exception	5
5	File Handling Understanding read function, read(), readline() and readlines(), Understanding write functions, write() and writelines(), Programming using file operations, Reading config files, Writing log files in python	5
6	OOP in Python Creating Classes in Python, Instance Methods, Inheritance, Polymorphism, Exception Classes and Custom Exceptions	5
7	Introduction to Libraries in Python NumPy, Matplotlib, OpenCV, Tkinter	7
8	Python SQL Database Access Introduction to database driven program, Database Connection, Database Operations: INSERT, READ, UPDATE, DELETE, COMMIT AND ROLLBACK.	4

(b) Practical	30 hours
i. Introduction to Python console, operators, input and output statements.	1 class
ii. Python control statements and functions	3 classes
iii. Data Structures in python	2 classes
iv. Exception Handling	1 class
v. File Handling	2 classes
vi. Object Oriented Python programming	2 classes
vii. Introduction to libraries (NumPy, Matplotlib, OpenCV)	1 class
viii. Python SQL Database Connection and database operations	3 classes

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Paper Name: SOFTWARE ENGINEERING

1. Learning Outcome

On successful completion of this course, the student should be able to:

- Determine the primary problems that impact all software development processes.
- Choose relevant software development processes models, methodologies, and strategies for managing a specific software development process, and justify the choices
- Implement different software estimation metrics such as cost, effort size, staffing etc.
- Describe various software design approaches and various coding, and testing strategies used in software engineering principles

2. Prerequisite: Nil

3. Semester: VI

4. Course Type: Compulsory

5. Course Level: 100-199

6. Theory Credit: 4

7. Practical Credit: 0

8. Number of required hours:

- p) Theory: 60 hrs
- q) Practical: 0 hrs
- r) Non Contact: 5 hrs

9. List of reference books

- a) Rajib Mall: *Fundamentals of Software Engineering*; PHI Learning Pvt. Ltd.
- b) Roger S. Pressman: *Software Engineering: A practitioner's Approach*; McGraw Hill.

Unit no.	Unit content	No.of classes
1	Introduction Definition of Software Engineering, differentiation between Computer Science, Software Engineering and System Engineering, Program V/s software product, Exploratory style and modern style of software development, need of software engineering, characteristics of good software product	8
2	Software Development Life Cycle models Definition of software development Life cycle models, Various life cycle modes: Classical Waterfall model, Iterative Waterfall model, Prototyping model, Evolutionary (Incremental) model, Spiral model, Advantages and disadvantages of each of these cycle models.	10
3	Software specification and Project Management Concept and Importance of Feasibility Study in Software design, Types of Feasibility: <i>Technical, Economical and Operational</i> feasibility, Requirement	14

	gathering and Analysis process, Components of an SRS (Software Requirement Specification), Properties of a good SRS, Different users of SRS, Basic idea of Software Project Management, Job Responsibilities of a Software Project Manager, Need of SPMP (Software Project Management Plan) document, Need of Software documentation, Internal and External documentation, Software size estimation using Lines of Code (LOC), Merits and Demerits of LOC metric.	
4	<p>Software Design principles and Methodology</p> <p>Top down and bottom up approach, External Design, Architectural Design and Detailed design, Concept of Cohesion in software design, Classification of Cohesion, Basic concept of Coupling, Classification of Coupling, Introduction to software Analysis and Software Design (SA/SD), Introduction to Data Flow Diagram, Symbols used in DFD, Context Diagram in DFD, Advantages and Disadvantages of DFDs.</p>	14
5	<p>Coding and Testing</p> <p>Goals of coding, Code Review techniques: Code Walkthrough, Code Inspection, Definition of Test cases, test suits, negative testing and positive testing. Different levels of software testing: unit testing, Integration Testing, System Testing and acceptance testing. Basic concept of Black box testing approach, Idea of White Box testing approach, Statement Coverage, Branch Coverage approach</p>	14

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