

UNIVERSITY OF MUMBAI

No.UG/ 318 of 2005

CIRCULAR :

A reference is invited to the Ordinances, Regulations and Syllabi relating to the Part-time Diploma course in Computer Programming (D.C.P.) vide Pamphlet No.219 and to this office Circular No.UG/175 of 1998 dated 29th May, 1998 and the Head, University Department of Computer Science and the Heads of the affiliated recognised institutions imparting instruction for the said course are hereby informed that the recommendation made by the Ad-hoc Board of Studies in Computer Science at its meeting held on 7th June, 2005 has been accepted by the Academic Council at its meeting held on 14th June, 2005 vide item No.4.40 and that in accordance therewith the syllabus, scheme of examination and fee structure for the Diploma in Computer Programming (DCP) Course is revised as per Appendix and that the same has been brought into force with effect from the academic year 2005-2006.

Mumbai 400 032,
8th August, 2005.

[Signature]
for REGISTRAR.

A.C.4.40/14.06.2005

To,

The Head, University Department of Computer Science and the Heads of the affiliated recognised institutions

No.UG/ 318-A

of 2005

8th August, 2005.

Copy forwarded with Compliments for information to :-

1. The Dean, Faculty of Science
2. The Chairman, Ad-hoc Board of Studies in Computer Science.

[Signature]
for REGISTRAR.

14/6/05

UNIVERSITY OF MUMBAI

Revised Syllabi of Diploma in Computer Programming (DCP)

(With effect from the academic year 2005-2006)

**Revised Syllabi of Diploma in Computer Programming (DCT) by
University Department of Computer Science**

PAPER I

SECTION – I : Organization of Computers (15 Lectures)

8. **Simple Model of a Computer** : Block Diagram, Characteristics of a Computer, Flow Charts, What is an algorithm, Algorithms and Programs, Working of a Computer.
9. **Evolution of Computers** : The various Generations of Computer Systems, Zeroth Generation – Mechanical Computers, First Generation – Use of Vacuum Tubes, Second Generation – Use of Transistors, Third Generation – IC's, Fourth Generation – VLSI and PC's, IBM System / 360, POWER PC Series.
8. **Data Representation** : Representation of Characters, integers, ASCII and EBCDIC codes, binary, octal, hexadecimal representations, representation of fractions, conversion from one representation to another. Arithmetic : fixed point and floating point, Addition, Subtraction, Multiplication and Division.
8. **Input output Devices** : Terminals, CRT, character map and bit map terminals, keyboard, mouse, printers – impact, dot matrix, laser printer.
8. **Computer memory** :
Memory cell, units of memory bit, bytes, register, MAR, MDR.
Memory types – CPU registers, primary and secondary memory, Cache, Performance, characteristics.
Access Modes – Random and Serial Access
RAM, ROM's, Magnetic disks, tape and optical memory, cache and virtual memory, memory allocation basics.
8. **Processor** : Instruction, Instruction format, fetch-execute cycle, traps and interrupts.
Addressing – immediate, direct, register addressing and indirect addressing – indexing, stack addressing.
8. **Computer Architecture** : Interconnection of units, Different types of bus, Processor to memory communication, Processor to I/o communication, DMA, Concepts of multiprogramming, interrupt and virtual memory. Communication within a computer, buses, the system bus-control, address and databuses, the IO (local) bus, SCSI, PCI, Synchronous bus, bus cycles, asynchronous bus.
8. **Programming Language and operating system** : What is a Programming language, Assembly language, higher level language, Need for Operating System, Different types of Operating Systems: batch, multiprogramming, time-sharing, on-line and real time.

SECTION - II : C Programming Language (25 Lectures)

1. **Introduction** : Evolution of C language, Unix and C, C Compiler, Running a C program, object and executable file, preprocessor, Characteristics of C language, case sensitiveness.
2. **Variables and Expressions** : C character set, identifiers and keywords, variables, reading and displaying variables, scanf and printf, characters and character strings, integer, float, double, constants, operators and expressions, arithmetic, relational, logical, assignment, conditional, increment and decrement, bit wise, comma, typedef statement, typecasting, operator precedence, writing simple programs to illustrate the above.
3. **Basic Input Output** : getchar, putchar, string input and output, format specifiers, types of characters in format strings like %, scanf width specifies, Input fields for scanf.
4. **Control Structures (Decision making statement)** if, if-else, multiway decisions, switch, (loop constructs) for-loop, while-loop, do-while-loop, compound statements, break statement, continue statement, go to statement.
5. **Functions** : main, include, placement of a function and return values, parameter set of a function, Combining function definition and declaration, passing arguments, return statement and function call, user defined and library functions, simple examples of recursion.
6. **Arrays** : Single dimensional array, element type, multidimensional array, strings, simple examples and programs, arrays of strings, programming examples
7. **Pointers** : Definition and use of pointers, address operator & and pointer variables, dereferencing pointers, void pointers, pointer arithmetic, pointers and arrays, pointers and function.
8. **Structures and Unions** : declaring and using structures, structure initialization, structure within a structure, operation on structures, array of structures, array within a structure, structures and functions, pointers to structures, Unions, operation on union, scope of union.
9. **Files** : opening files, writing to files, reading from files, closing files, file handing functions, fscanf, fprintf, fopen, fclose, fgetc, fgets, fputc, fputs, fwrite.

PAPER – II

SECTION - I : Data Communication, Networking & Internet fundamentals (15 Lectures)

1. **Data Communication Fundamentals** : Communication model (source, transmitter, transmission system, receiver, destination), DTE, DSE, What is a signal, Frequency, Spectrum, bandwidth, transmission media (twisted pair, co-axial cable, optical fibers), data encoding, multiplexing, OSI model.
2. **Networking and Network Design** : Need of networking, types of networks, LAN, MAN, WAN, network topologies, internetworking. What is network design, Tasks in Designing a network, Identifying requirement, business needs, security, accessibility, choosing a suitable architecture.
3. **Network Traffic Management** : Need for traffic management, fundamentals, classifying traffic management, packet switching, circuit switching, message and cell switching.
4. **Protocols** : What is a protocol, IEEE 802.2 to 802.6 Ethernet, token passing protocol, token ring protocol.
5. **Addressing and Routing** : IP Address classes, sub netting, IP Routing, TCP/IP
6. **Network Security** : Introduction and need for security, Authentication, Access Controls, Server logs, Virus Protection, Firewalls, Intrusion Detection System, VPN.
7. **Internet Basics** : What is Internet, History and Introduction, Accessing the Internet, Protocols TCP/IP, SLIP, PPP, Components of URL, FTP, Telnet, HTTP, Web Browsers, Search Engines, Advanced search, Email Services, Spam and Emoticons, Chatting, Conferencing, Creating a Home Page, a Web Site, Viruses, Worms, Firewalls.
8. **Hypertext Markup Language** : Evolution of HTML, Basic HTML, Structure of an HTML document, inserting links, images, horizontal rules, comments, formatting text, heading, colors, fonts and sizes, simple tables, forms and frames.

SECTION – II : Java Programming Language (25 Lectures)

1. **Introduction to JAVA Programming** : What is java, history of java, features of java, different types of java programs, java virtual machine, JDK tool.
 2. **Object Oriented programming** : Object oriented approach, object oriented programming, objects and classes, behavior and attributes, fundamental principles of OOPs (encapsulation, inheritance, polymorphism, data abstraction).
 3. **Java Basics (Data Concepts)** : Variables and data types, declaring variables, literals, numeric literals, Boolean literal, character literals, string literals, keywords, type conversion and casting.
 4. **Java Operators** : Assignment operator, arithmetic operators, relational operators, logical operators, bit wise operators, incrementing and decrementing operators, conditional operator, precedence and order of evaluation. statements and expressions, string arithmetic.
 5. **Loops and Controls** : Control statements for decision making : selection statements (if statement, if-else statement, if-else-if statement, switch statement), goto statement, looping (while loop, do while loop and for loop), nested loops, breaking out of loops (break and continue statements).
 6. **Arrays** : Arrays, declaring array variables, creating array objects, accessing array elements.
 7. **Introduction to Classes and Methods** :
Classes : Declaring a class, declaring objects of a class, accessing instance variables and methods of a class.
Methods : Declaring methods, naming methods, accessing methods of a class, keyword 'this'.
Special Methods : Constructor, finalize and overloading, Command line arguments.
 8. **Inheritance, Interfaces and Packages** : Super and sub classes, generalization, keyword 'extends', use of the keyword 'super', overriding method, 'final' keyword, abstract classes, concept of interfaces and packages.
 9. **Java Applets Basics** : How applets and application are different, creating applets, life cycle of applet, passing parameters to applets.
 10. **Graphics, Fonts and Color** : The graphics class, painting the applet, font class, draw graphical figures like oval, rectangle, square, circle, lines and text using different fonts.
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PAPER - III

SECTION - I : Fundamentals of Operating System - Linux OS (15 Lectures)

1. **Introduction** : Requirements of an operating system, history of Unix and Linux operating system, features of Linux, open source software, Linux software, Linux distributions.
2. **Interface** : User account, accessing Linux, display manager – GDM and KDM, gnome desktop, command line interface, online documentation.
3. **LAN with Linux** : Physical configuration, web access, DNS setup, IP addresses, setting your firewall, shell command line, filename expansion, standard I/O, redirection, pipes, shell variables, simple shell scripts.
4. **Linux File Structure** : Linux files and directories, permission.
5. **Basic System Administration** : Superuser, system time and date, scheduling tasks, system startup files, system logs, managing users.

SECTION - II : DBMS and RDBMS using SQL (25 Lectures)

1. **Introduction to Database Concepts** : Database systems vs file systems, view of data, data models, data abstraction, data independence, three level architecture, database design, database language – data definition language (DDL), data manipulation language (DML).
2. **E – R Model** : Basic concepts, keys, E-R diagram, design of E-R diagram schema (simple example).
3. **Relational structure** : Tables (relation), rows (tuples), domains, attributes, candidate keys, primary key, entity integrity constraints, referential integrity constraints, query languages, normal forms 1, 2, and 3 (statements only), translation of ER schemas to relational (database) schemas (logical design), physical design.

4. SQL Commands and Functions :

DDL Commands : Create, alter, drop, and rename.

Basic Structure and DML Commands : Select clause, where clause, from clause, insert, update and delete.

String Functions : lower(), ltrim(), patindex(), replicate(), reverse(), right(), rtrim(), space(), space(), upper().

Data Functions : dateadd(), datediff(), getdate(), datename(), year, month, day, week.

Aggregate Functions : avg, sum, min, max, count.

Queries : Simple queries and nested subqueries.

Indexes : Advantages and disadvantages of using indexes, types of indexes, creating index.

Views : What is view, creating a view, altering a view and renaming a view.

References:

PAPER – I

SECTION – I

1. Fundamentals of Computers by Rajaraman
2. Structured Computer Organization by Andrew Tannenbaum
3. Computer Organization by William Stallings
4. Computer System and Architecture by Morris Maro

SECTION – II

1. Programming with C by Venugopal and Sudeep R. Prasad
2. Let us C by Kanetkar
3. Spirit of C by Munish Koopar
4. Programming in ANSI C by Ram Kumar and Agarwal

PAPER – II

SECTION – I

1. Data Structure with application by Trembley and Sorenson
2. Data Structure by Horowitz and Shahani
3. Data Structures using C by Andrew Tannenbaum, Largsan and Augenstein
4. Data Structure by Shaum Series

SECTION – II

1. The Complete reference java 2 by Patrick Niaughton, Herbert Schind.(TMH)
 2. Thinking in java by Bruce Ecket (Addision Wesley)
 3. Core Java Volume I (Fundamental) by Cay S. Horstmann, Gary Cornell (Pearson's Education Asia)
 4. Java Programming from the beginning by K. N. King (W.W. Norton & Co.)
 5. Java 2 Developer's Handbook by Philip Heller, Simon Roberts (BPB)
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PAPER – III

SECTION – I

1. LINUX Complete Reference
2. RedHat 8.0/9.0 Unleashed

by Richard L. Petersen (Tata McGraw Hill)

SECTION – II

1. Workbook on System Analysis and Design by Vinod Kumar, Garg & S. Srinivasan
 2. System Analysis and Design Methods by Whitten, Bentley, Barlow
 3. Structured System Analysis Tools and Techniques by Gane Chris, Sarson Trish
 4. Fundamentals of Database Design by Elmasri and Nawathe.
 5. Database System Concepts by Siberschatz
 6. Database Management systems by Raghu Ramakrishnan, Johanners Gehrke.
 7. Understanding SQL by Martin Gruber (BPB/Sybex 1995)
 8. Teach Yourself Microsoft SQL Server 7.0 from SAM's publications.
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Scheme of Examination (DCP) :

	PAPER	Marks for Internal Assessment	Marks for University Exam. (Viva-Voce)
I	Section I : Organization of Computers	50	Viva of Marks 100 on all the three Papers together
	Section II : C Programming Language	50	
II	Section I : Data Communication, Networking and Internet fundamentals	50	
	Section II : Java Programming Language	50	
III	Section I : Fundamentals of Operating System - Linux OS	50	
	Section II : DBMS and RDBMS using SQL	50	
		300	100
Total Marks :			400

UNIVERSITY OF MUMBAI
DEPARTMENT OF COMPUTER SCIENCE
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FEE STRUCTURE

© Diploma in Computer Programming (D.C.P.) – Duration 6 months

Tution Fee	: Rs. 8,400 /-
Lab Fee	: Rs. 2,000 /-
Diploma Fee	: Rs. 150 /-
Total	: Rs. 10,550 /-
