

**PANJAB UNIVERSITY CHANDIGARH- 160 014 (INDIA)**

(Estded. under the Panjab University Act VII of 1947-enacted by the Govt. of India)



**FACULTY OF SCIENCE**

**SYLLABI**

**FOR**

**POSTGRADUATE DIPLOMA**

***IN***

**COMPUTER APPLICATINS**

***FOR***

**EXAMINATIONS 2013**

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## Outline of the Syllabi and Courses for Post Graduate Diploma in Computer Applications for Examination - 2013.

<i>Paper Code</i>	<i>Paper Name</i>	<i>L</i>	<i>T</i>	<i>P</i>	<i>Exam. Marks</i>	<i>Int.Ass. Marks</i>	<i>Total Marks</i>	<i>Exam Hours</i>
		<i>Hrs./Week</i>						
PGD-01	Fundamentals of Information Technology	3	1		80	20	100	3
PGD-12	DBMS Using SQL	3	1		80	20	100	3
PGD-03	Computer Based Accounting	3	1		80	20	100	3
PGD-04	Computer Networks & Data Communications	3	1		80	20	100	3
PGD-05	Computer Programming & Problem Solving ( Using C/C++)	3	1		80	20	100	3
PGD-06	Web Application Tools and E-Commerce	3	1		80	20	100	3
PGD-07	Practical Software Lab.			5	60	15	75	4
PGD-08	Practical DBMS Lab.			5	60	15	75	4
PGD-09	Practical Programming Lab. in C/C++			5	60	15	75	4
PGD-10	Practical Web Programming Lab.			5	60	15	75	4
PGD-11	Project Work : Project will involve Development of Business Application						100	

Note : Pass Marks 40% marks in Theory, Internal Assessment and Practical separately.  
50% marks for Project Work.  
50% marks in Aggregate to qualify the examinations.

**Paper Title : FUNDAMENTALS OF INFORMATION TECHNOLOGY**  
**Paper Code : PGD-01 Max. Marks : 80 Time : 3 Hrs.**  
**Course Duration : 60 Lectures of one hour each.**

**Objective: The course enables students to know the basics of computers, O.S. microprocessors & Applications Software.**

**Note :**

- i. The Question Paper will consist of Four Sections.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
- iv. All questions carry equal marks unless specified.

### **SECTION - A**

#### **1. Basics of Computers and Number Systems**

Introduction to computer (ALU , Memory, CU), booting process, introduction of the concepts-bit, byte, word, hardware, operating system, system and application software, machine, assembly and high level languages, compilers, assemblers, loaders and linkers.

ASCII and EBCDIC codes, Binary, Octal, Decimal and hexadecimal number systems and their conversion, Integer and floating point representation, error detection techniques.

#### **2. Input And Output Devices**

Various input devices such as keyboard, mouse, joystick; output devices such as monitor (CGA, EGA, VGA and SVGA), different types of printers and plotters.

(No. of Lectures : 15)

### **SECTION - B**

#### **3. Memory**

Primary and secondary memory: RAM, ROM, PROM, EPROM, Cache, extended and expanded memory.

Removable and non-removable secondary memory : tapes, disks, CDROM, DVD, comparison of these devices based on technology and speed.

Organization of data on disks : Tracks, sectors, cylinders, heads, access time, seek time and latency time.

#### **4. Operating Systems - DOS, Windows and Unix.**

Features of DOS, windows and Unix operating systems and their comparison. Internal and External commands of DOS, File and directory management commands such as DIR, COPY, TYPE, DEL DELTREE, UNDELETE,

CHKDSK, FORMAT, XCOPY, SCANDISK, creating batch files using REM, ECHO, PAUSE, IF, GOTO. AUTOEXEC.BAT and CONFIG.SYS files.

Concepts of window, menu, icon, opening, closing and resizing windows, creating folder, Using Start, control panel, recycle bin and online help, using windows explorer to manage files and directories.

Overview of UNIX structure, general purpose UNIX commands such as date, echo, cal, bc, pwd, passwd, file and directory commands such as ls, mkdir, cp, mv, rm, process management commands such as ps, kill, communication commands such as news, mesg, wall; working with editor, introduction to shell programming.

(No. of Lectures : 15)

### SECTION - C

#### 5. Introduction to Microprocessor

Various cards and chips, parallel and serial ports, typical configuration of a Pentium Computer , instructions execution, types of interrupts and interrupt handling

PC-Tools, Norton Utilities, Virus detection, prevention and anti-virus packages

(No. of Lectures : 14)

### SECTION - D

#### 6. Installation and using Application Software and Data Management Tools.

Understanding the features and applications of the following software and tools. MS-Word, MS-Excel, MS-Power Point,.

(No. of Lectures : 16)

#### References :

1.	Basandra, S.K., 2007	:	Computers Today's by Galgotia Publications, N.Delhi
2.	Sanders, Donald M, 1988	:	Computers Today's by McGraw Hill, New York, 3 <sup>rd</sup> ed., N.Y. Int. ed.
3.	Sinha, P.K, 2009	:	Computer Fundamentals by. BPB Pubs, New Delhi, 4 <sup>th</sup> ed.
4.	Rajaraman, V., 2003	:	Fundamentals of Computers, PHI, New Delhi, 4 <sup>th</sup> ed.
5.	Texali, R.K. 2002	:	PC Software made simple by. - Tata McGraw Hill – 7 <sup>th</sup> Rep. New Delhi..
6.	Dysen, Peter, 1991	:	Understanding PC Tools Tech, Singapore.
7.	Dysen, Peter, 1991	:	Understanding Norton Utilities Tech, Singapore.
8.	Curtin, 1999	:	Information Technology TMH, New Delhi.
9.	Mansfield, Ron, 1993	:	Compact Guide to Windows, Word and Excel BPB Publishers. 1 <sup>st</sup> Indian ed. New Delhi: BPB Pub.

**Paper Title : DATABASE MANAGEMENT SYSTEM Using SQL**

**Paper Code : PGD -12**

**Max. Marks : 80**

**Time : 3 Hrs.**

**Course Duration : 60 Lectures of one hour each.**

**Objective: This course gives an overview of Database concepts, design, security & privileges and an introduction to SQL \* PLUS.**

**Note :**

- i. The Question Paper will consist of Four Sections.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
- iv. All questions carry equal marks unless specified.

### **SECTION - A**

**1. Data Base Concept :**

Data Base Vs file oriented approach, Basic DBMS terminology, Data independence, General Architecture of a Data Base Management Software, Components of DBMS, Advantages and Disadvantages of DBMS. Distributed Databases, Structure and Design of Distributed Databases.

(No. of Lectures : 7)

**2. Data Base Design**

Introduction to Data Models, Entity Relationship Model, Entities, Attributes, E-R Diagrams, Conceptual Design of a relational data base model. Comparison of Network, Hierarchical and Relational Model. Client/Server Architecture.

(No. of Lectures : 8)

### **SECTION - B**

**3. Relational Model :**

Storage organization for Relations, Relational Algebra, Relational Calculus, Functional dependencies, multivalued dependencies, Normalisation.

(No. of Lectures : 10)

**4. Database Security :**

Database Integrity, Security, Concurrency, Recovery,

(No. of Lectures : 10)

### **SECTION - C**

**5. Introduction to –SQL \*Plus:**

Introduction to SQL, Oracle Data types, Starting SQL \*Plus, Querying database tables, Conditional retrieval of rows, Working with Null Values, Matching a pattern from a table, Ordering the Result of a Query, Grouping the Result of a Query, ROLLUP Operation: Getting Sub Totals, CUBE Operation: Getting Cross Tabs, Command Summary of SQL \*Plus Editor.

(No. of Periods : 5)

**6. Querying Multiple Tables & Functions :**

Collating Information: Equi Joins, Cartesian Joins, Outer Joins, Self Joins; SET Operators: Union, Intersect, Minus; Nested Queries. Functions: Column Functions, Arithmetic Functions, Character Functions, Date Functions, General Functions; Group Functions.

(No. of Periods : 5)

**7. Data Manipulation and Control:**

Data Definition Language (DDL), Creating Tables, Inserting Values into a Table, Updating Column(s) of a Table, Deleting Row(s) From a Table, Dropping a Column, Introduction to VIEWS, Manipulating the Base table(s) through VIEWS, Rules of DML Statements on Join Views, Dropping a VIEW, Inline Views, Materialized Views.

(No. of Periods : 5)

**SECTION - D**

**8. Database Security and Privileges, GRANT Command, REVOKE Command, Application Privileges Management, Enhancing Performance, Sequences, Maintaining Database Objects, COMMIT and ROLLBACK.**

(No. of Periods : 5)

**PL / SQL**

Introduction to PL/SQL, The Advantage of PL/SQL, PL/SQL Block Structure, PL/SQL Data Types, Variables and Constants, Assignments and Expressions, Operator Precedence, Built-in-Functions, Conditional and Iterative Control, Cursor Management in PL/SQL, Cursor Manipulation, Implicit Cursor Attributes, Procedure, Functions, Trigger, Types of Triggers, Dropping Triggers.

(No. of Lectures : 10)

**References :**

1.	Desai B.C., 2008	:	An Introduction to Database Systems, Galgotia Pub. New Delhi, Rev. ed.
2.	Date, C. J., 1998	:	Database Systems Vol. I & II, Narosa Publ., New Delhi (Indian student ed.)
3.	Henry F. Konth Abraham, 2006	:	Database System Concepts, McGraw Hill Inc., New York International ed.
4.	Mukhi, Vijay 1993	:	Mastering Oracle 6.0 BPB Publication, New Delhi 1 <sup>st</sup> ed.
5.	James T. Perry; Joseph G. Lateer, 1996	:	Understanding ORACLE, BPB Publications
6.	O'Reilly, 1997	:	Oracle PL/SQL Programming , Shroff Publications Mumbai; Shroff.
7.	Rowski, Bob 1996.	:	Oracle 7 Client server Computing,. BPB publications N.D. , 2 <sup>nd</sup> ed.

**Paper Title : COMPUTER BASED ACCOUNTING.**

**Paper Code : PGD-03**

**Max. Marks : 80**

**Time : 3 Hrs.**

**Course Duration : 60 Lectures of one hour each.**

**Objective: The course gives an introduction to the basic books of accounts and computerized accounting.**

**Note :**

- i. The Question Paper will consist of Four Sections.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
- iv. All questions carry equal marks unless specified.

#### **SECTION - A**

1. **Accounting:** Principles, concepts and conventions, double entry system of accounting, introduction of basic books of accounts of sole proprietary concern, control accounts for debtors and creditors, closing of books of accounts and preparation of trial balance.

(No. of Lectures : 9)

2. **Final Accounts:** Trading, profit and loss accounts and balance sheet of sole proprietary concern with normal closing entries.

(No. of Lectures : 6)

#### **SECTION - B**

3. Introduction to manufacturing account, final accounts of partnership firms, limited company.

(No. of Lectures : 5)

4. Introduction to computerized financial accounting, coding logic and codes required, master files, Transaction files, Introduction to documents used for data collection, processing of different files, outputs obtained.

(No. of Lectures : 10)

#### **SECTION - C**

5. Introduction to computerised Inventory control, types of inventory and associated documents, Inventory reports-nature and types, Inventory Control : ABC and Ageing analysis, Methods of Stock validation : LIFO, FIFO, actual bases, Interfacing Inventory with Financial Accounting, Purchasing Sub-Systems, Sales Order processing.

(No. of Lectures : 8)

6. Introduction to Computerised Payroll & Invoicing Applications, Exposure to : Structure, Processing and Reports, Interfacing these applications to financial Accounting.

(No. of Lectures : 7)

### SECTION - D

7. Use of Accounting package Tally : Introduction to Tally, Groups, Ledgers, Vouchers, Orders, Cost Centres and Categories. Stock. Reports in Tally

(No. of Lectures :15)

### References :

1.	Kellock, J., 1972	:	Elements of Accounting, Heinemann 1 <sup>st</sup> ed., London.
2.	Rockely, L.E., 1970	:	Finance for the Non-Accountant 2 <sup>nd</sup> . Edition, London : Business Book.
3.	Levy and Sarnet, 1991	:	Principle of Financial Management, Prentice-Hall International, PHI .
4.	Arnolel, 1984	:	Financial Accounting, Prentice-Hall International (Paperback Edition).
5.	Horngren and Sundem, 2010	:	Introduction to Financial Accounting, Prentice-Hall International (Paperback Ediion) N.D: PHI.
6.	Murthy, U.S.	:	Management Finance, 2 <sup>nd</sup> . Edition, Vakils Fefers & Simons Ltd.
7.	Van Home, James, C., 2004	:	Financial Management & Policy, Prentice Inc.
8.	Pandey, I.M., 1979	:	Financial Management, Vikas Publication, 6 <sup>th</sup> Rev. ed., N.Delhi.



**Paper Title : COMPUTER NETWORKS AND DATA COMMUNICATIONS.**

**Paper Code : PGD-04**

**Max. Marks : 80**

**Time : 3 Hrs.**

**Course Duration : 60 Lectures of one hour each.**

**Objective: The course aims at familiarizing the students with fundamentals of computer networks.**

**Note :**

- i. The Question Paper will consist of Four Sections.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
- iv. All questions carry equal marks unless specified.

**SECTION - A**

1. Introduction to Data Communication, Analog vs Digital Communication; Fourier Analysis, Band Width Limitation, Data rate of a channel, Error Detection and Correction: Nature of errors, Parity Check, CRC, Hamming Code, Modulation techniques :AM, PM, FM, Synchronous and Asynchronous Modulation, Multiplexing : SDM, FDM, TDM, STDM.

(No. of Lectures : 15)

**SECTION - B**

2. Introduction to Computer networks and applications; Network structure and Architecture, OSI reference model, Network standardization, Physical Layer: Circuit switching, Packet Switching, Message Switching, Terminal Handling, Telephone system, modems, congestion, Multi channel Access, Transmission media.

(No. of Lectures : 15)

**SECTION - C**

3. The Data Link Layer : Design Issues, Elementary Data Link Protocols, Sliding Windows Protocol, Protocol performance, Protocol Specification & verification, DLL in X.25, HDLC/SDLC.

(No. of Lectures : 15)

**SECTION - D**

4. The Network Layer : Design Issues, Routing Algorithms, Congestion Control Algorithms, Internet working, Example of Network layer in ARPANET, X.25 Protocol.

(No. of Lectures : 15)

**References :**

1.	Tanenbaum, Andrew S.2006	:	"Computer Networks" PHI. N.D., 4 <sup>th</sup> ed.
2.	Schwaber	:	"Data Communication".
3.	Stalling William Maxwell, 1991	:	"Data and Computer Communication", Macmillan International edition.
4.	McGoven, Tom, 1988	:	"Data Communication : Concepts & Applications", (Prentice Hall).

**Paper Title : COMPUTER PROGRAMMING AND PROBLEM SOLVING (Using C/C++)**  
**Paper Code : PGD-05**                      **Max. Marks : 80**                      **Time : 3 Hrs.**  
**Course Duration : 60 Lectures of one hour each.**

**Objective: This course is to enable students to solve problems on computers and do programming in C/C++.**

**Note :**

- i. The Question Paper will consist of Four Sections.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
- iv. All questions carry equal marks unless specified.

#### **SECTION - A**

**1. Problem Solving :**

Problem Identification, Analysis, Flow charts, Decision Tables, Pseudo code and algorithms, Program Coding, Program Testing and Execution.

(No. of Lectures : 7)

**2. Computer Programming Language (C Language) :**

Concept of variable and constants, structure of a C program, various operators, expression and their evaluation using rules of hierarchy. Assignment Statements.

(No. of Lectures : 8)

#### **SECTION - B**

**3. C Language**

Control Structures; Sequencing, alteration and iteration; Arrays, Manipulating vectors and matrices, pointers, String functions, structures, User defined functions, Input/Output files, Pre-Processors, Macros.

(No. of Lectures : 15)

#### **SECTION - C**

**4. Object Oriented Programming Language (C++ Language)**

Introduction to Object Oriented Programming - Objects, Classes, Data abstraction, Data encapsulation, Inheritance (Single, Multiple, Hierarchical, Multilevel, Hybrid) Polymorphism, Dynamic binding, Message Passing. Tokens, expressions, data types, variables, operators, control statements.

(No. of Lectures : 15)

#### **SECTION - D**

**5. C++ Language**

Arrays constructors & destructors.  
Classes, objects, functions & methods.  
File handling, exception handling and templates.

(No. of Lectures : 15)

## References :

1.	Kanetkar, Yashavant 2007.	:	Let us C, BPB Publications, New Delhi, 8 <sup>th</sup> Rev. ed.
2.	Gottfried, B., 1991.	:	Theory and problems of Programming in C, Schaum Series.N.D. TMH.
3.	Salaria, R. S.	:	Object-Oriented Programming Using C++; 3 <sup>rd</sup> ed. Khanna Book Publishing Co. (P) Ltd., New Delhi.
4.	Sinha, P.K., 2004	:	Computer Fundamentals, BPB Publications, 4 <sup>th</sup> ed., N. Delhi .
5.	Balaguruswamy, E., 2009.	:	Object Oriented Programming with C++, Tata McGRAW Hill, 4 <sup>th</sup> ed.
6.	Laffor, Robert 1996.	:	Object Oriented Programming in C++, Galgotia Publication, N.D. :
7.	Ravichandran, V., 2002	:	Programming with C++, Tata McGRAW Hill
8.	Kanetkar Yashavant, 1999	:	Let us C++, BPB Publications, New Delhi (First edition)
9.	John R. Hubbard, 2006	:	Programming with C++ Shaum's Series, Tata McGraw Hill. N.D. TMH, 2 <sup>nd</sup> ed.
10.	Salaria, R. S., 1999	:	Application Programming in C; Khanna Book Publishing Co. (P) Ltd., New Delhi.

**Paper Title : WEB APPLICATION TOOLS AND E-COMMERCE.**

**Paper Code : PGD-06**

**Max. Marks : 80**

**Time : 3 Hrs.**

**Course Duration : 60 Lectures of one hour each.**

**Objective: The course enables students to use web application tools (HTML/DHTML/JAVA/ASP) and gives a brief introduction to E-Commerce.**

### **Note :**

- i. The Question Paper will consist of Four Sections.
- ii. Examiner will set total of **NINE** questions comprising **TWO** questions from each Section and **ONE** compulsory question of short answer type covering whole syllabi.
- iii. The students are required to attempt **ONE** question from each Section and the Compulsory question.
- iv. All questions carry equal marks unless specified.

### **SECTION - A**

1. Introduction to HTML/DHTML: Building blocks of HTML, lists, links, images, tables, frames, layers forms, Introduction to cascading style sheets (CSS).

- ASP: Introduction, basics of VB Script( data types. Variables, operators, control structures, built-in functions etc.), ASP objects, writing simple ASP scripts.

### **SECTION - B**

- Fundamentals of Java : Java Vs. C++, Byte code, Java virtual machine, constants, variables, data types, operators, expressions, control structures, defining class, creating objects, accessing class members, String Handling, arrays and vectors.
- Inheritance: Basics, member access, method overloading, using abstract classes, using Final to prevent overriding/Inheritance.

(No. of Lectures : 15)

### **SECTION - C**

- Packages and Interfaces : Defining a package, understanding CLASSPATH, Access protection : Importing packages, Interfaces, Defining an Interface, Implementing. Interfaces, Applying, Interfaces
- Exception Handling: Fundamentals, exception types, using Try and catch, Multiple Try and Catch clauses, creating your own exceptions.
- Multi-threaded Programming: Creating threads, stopping and blocking threads, using threads methods

(No. of Lectures : 15)

### **SECTION - D**

- Introduction to Applet programming, graphics programming and I/O
- Introduction to Electronic Commerce, Legal and Security issues in Electronic Commerce

(No. of Lectures : 15)

### **References :**

1.	Naughton, Patrick & Schidt, , Herbert 1998	:	Java 1.1 The Complete Reference.,TMH, New Delhi.
2.	Jackson, J., 1996	:	Java by Example/ Sunsoft Press, Mountain view.
3.	Wiber, J., 1999.	:	Using Java 2 Platform/PIII/ New Delhi.
4.	Harlod, E., 1997	:	Java Secrets/ COMDEX computer, New Delhi, 1997.
5.	Zollim A., 1996	:	Mastering Java/BPB, New Delhi.
6.	Tihel, E., 1997.	:	Discover Java / Comdex, New Delhi.
7.	Phillips, 2000	:	Using HTML, PHI, 4 <sup>th</sup> . ed., New Delhi.
8.	Liang, 2000.	:	An Introduction to Java Programming by PHI,DHTML, New Delhi.

**Paper Title : Software Lab.**

**Paper Code : PGD-07**

**Max. Marks : 60**

**Time : 4 Hrs.**

**Objective:** This course is to familiarize students with different O.S., MS-Office and basics of Internet & Linux.

**1. DISK OPERATING SYSTEMS :**

The fundamental of DOS, DOS and DISK, Disk Organisation under-standing DOS prompt and Shell Screen using keyboard and mouse, internal commands; Batch files; Using the screen editor, printing image, ASCII Files; Indirect printing and spooling; communicating with other devices, parallel Vs. serial communication; Optimizing, DOS, CONFIG.SYS, and AUTOEXE.BAT files freeing up memory at boot time, managing extended and expanded memory, Ram disk, Disk Caching defragmentation.

**2. WINDOWS :**

Windows fundamental : Types of Windows, Anatomy of Windows; Windows Explorer, Customising Windows, Installing a Printer, Using Clipboard, Using Paintbrush, Control Panel, Taskbar Setting.

**3. MS-WORD :**

Fundamentals of MS-WORD : Menus, Toolbars, Ruler, Scroll Bars, Status Bar, Creating, Saving, Importing, Exporting and Inserting files; Pictures, Chart/ Graphs, Forms Tools, Equations and Macros.

**3. EXCEL :**

Worksheet Overview : Rows, Columns, Cell, Menus; Creating Worksheets; Opening and Saving Worksheet, Formatting, Printing, Charts, Windows, Establishing Worksheet files, Macros, database tables, using files with other programs.

**4. MS POWERPOINT :**

Salient features, Installation of Power point, starting & Opening from power point, various menu options and sub options.

**5. INTERNET :**

E-mail, FTP, WWW, Internet Explorer, HTML, Home page.

**6. LINUX : Installation and Commonly used commands.**

**Paper Title : DBMS Lab.**

**Paper Code : PGD-08**

**Max. Marks : 60**

**Time : 4 Hrs.**

This laboratory course will mainly comprise of:

Software development using ORACLE.

Program design and development for some general purpose database applications (e.g. library, hospital, banking, university, hotel management etc.)

**Paper Title : Programming Lab in C & C++.**

**Paper Code : PGD-09**

**Max. Marks : 60**

**Time : 4 Hrs.**

This laboratory course will be based on paper PGD-05 (Computer Programming and Problem Solving).

**Paper Title : Web Programming Lab.**

**Paper Code : PGD-10**

**Max. Marks : 60**

**Time : 4 Hrs.**

This laboratory course will be based on PGD-06.

**Paper Title : Project Work.**

**Paper Code : PGD-11**

**Max. Marks : 100**

Project on any database application using any database development tool is to be developed.

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