PANJABUNIVERSITY CHANDIGARH-160014(INDIA)

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

FACULTY OF SCIENCE

SYLLABI FOR

POSTGRADUATE DIPLOMA

IN

COMPUTER APPLICATIONS

FOR

EXAMINATIONS 2015–2016
(SEMESTER SYSTEM)

--:O:-

Outline of the Syllabi and Courses for Post Graduate Diploma in Computer Applications for Examination – 2015-2016 (Semester System).

FIRST YEAR (SEMESTER –I)

Paper Code	Paper Name	Lecture	Tutorial	Periods / Weeks	Exam. Marks	Int. Ass. Marks	Total Marks	Exam Hours
PGD-1001	Computer Fundamentals	**5**	**1**	**0**	**80**	**20**	**100**	**3**
PGD-1002	Computer Programming using C/C++	**5**	**1**	**0**	**80**	**20**	**100**	**3**
PGD-1003	Computer Based Accounting	**5**	**1**	**0**	**80**	**20**	**100**	**3**
PGD-PR01	Practical Software Lab. **(PGD – 1001)**	**0**	**0**	**12**	**60**	**15**	**75**	**4**
PGD-PR02	Practical Programming Lab. in C/C++ **(PGD – 1002)**	**0**	**0**	**12**	**60**	**15**	**75**	**4**
							TOTAL MARKS = 450	

FIRST YEAR (SEMESTER –II)

Paper Code	Paper Name	Lecture	Tutorial	Periods / weeks	Exam. Marks	Int. Ass. Marks	Total Marks	Exam Hours
PGD-2001	DBMS Using SQL	**5**	**1**	**0**	**80**	**20**	**100**	**3**
PGD-2002	Web Based Applications and Electronic Commerce	**5**	**1**	**0**	**80**	**20**	**100**	**3**
PGD-2003	Data Communications and Networks	**5**	**1**	**0**	**80**	**20**	**100**	**3**
PGD-PR03	Practical RDBMS Lab. **(PGD – 2001)**	**0**	**0**	**12**	**60**	**15**	**75**	**4**
PGD-PR04	Practical Web Programming Lab. **(PGD – 2002)**	**0**	**0**	**12**	**60**	**15**	**75**	**4**
PGD-2004	**Project Work :** Project will involve Development of Business Application	**0**	**0**	**6**	**0**	**--**	**100**	**--**
							TOTAL MARKS = 550	

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.

SEMESTER -I

Paper Title : COMPUTER FUNDAMENTALS

Paper Code : PGD-1001 Max. Marks : 80 Time : 3 Hrs.
Course Duration: 60 Lectures
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 to 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.

SECTION - B

2. Input and Output Devices: Various Input Devices such as keyboard, mouse and joystick, Output Devices: Monitors (CGA, EGA, VGA and SVGA), different types of Printers and Plotters.

3. Memory: Primary and secondary memory: RAM, ROM, PROM, EPROM, Cache, 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. Introduction to Typical Configuration of a PC , Instructions Execution Cycle, Introduction to Interrupt and Its Types, Virus Detection And Prevention.

SECTION – C

5. Operating Systems – DOS, Windows and UNIX.

Comparison of main features of DOS, UNIX and Windows Operating Systems.

DOS: Internal DOS commands such as DIR, COPY, TYPE, DEL, DATE, and External commands such as UNDELETE, DELTREE, XCOPY, MOVE, and SCANDISK.

Windows: GUI, Icons, Toolbar, Control panel, Explorer: Files and directory management under windows , Accessories, Network Neighborhood, System Tools, Recycle Bin, Installation of new software.

UNIX: 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.

SECTION - D

6. **Word Processing Software**: Basics of Word Processing: creating, opening, saving, and printing document, using the Interface (Menu Toolbars), editing Text (Copy, Delete, Move etc.), Finding and Replacing Text, Spell Check, Autocorrect feature; Formatting: Character, Paragraph and Page formatting, adding Headers and Footers, setting up Multiple Columns.

7. **Spreadsheet Software:** Worksheet overview: Row, Column, Cells, Menus, creating, opening, saving, and printing worksheet; working with Ranges, working with Formulae and Functions (Statistical, Mathematical and String), number formatting.

8. **Presentation Software**: Basics features, selecting design templates, creating, saving and printing a simple presentation.

References :

1. Basandra, S.K : Computers Todays by Galgotia Publications, N.Delhi
2. Taxali, R.K : PC Software made simple by. - Tata McGraw Hill –New Delhi.
3. Sinha, P.K, : Computer Fundamentals by. BPB Pubs, New Delhi
4. Sanders, Donald M, : Computers Todays by McGraw Hill, New York, 3rd ed., N.Y. Int. ed.
5. Rajaraman, V. : Fundamentals of Computers, PHI, New Delhi,
6. Curtin : Information Technology TMH, New Delhi.
7. Mansfield, Ron, : Compact Guide to Windows, Word and Excel BPB Publishers New Delhi
8. Norton, P. : Complete guide to LINUX, Techmedia

Paper Title: COMPUTER PROGRAMMING Using C/C++

Paper Code : PGD-1002 **Max. Marks : 80** **Time : 3 Hrs.**
Course Duration: 60 Lectures of one hour each.
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

Problem Solving:
Problem Identification, Analysis, Flow charts, Decision Tables, Pseudo code and algorithms, Program Coding, Program Testing and Execution.
C Language Fundamentals: Concept of variables and constants, structure of a C program, various operators, expression and their evaluation using rules of hierarchy, Assignment Statements, Control Structures, Sequencing, alteration and iteration.

SECTION - B

Arrays: Declaring arrays, initializing arrays, processing of arrays, passing arrays as arguments to functions Manipulating vectors and matrices, Pointers: Definition, Declaring pointers, accessing values via pointers, pointer arithmetic, pointer to strings, passing arguments using pointers, String functions, array of strings,

SECTION - C

Structure and Unions: Defining a structure type, declaring variables of structure type, initializing structures. Accessing Structure Elements, array of structures, nested structures, Unions; Declaring a Union, Accessing elements of a type union. Input/output files, User defined functions, Pre-Processors, Macros.

SECTION – D

Object-Oriented Programming Language (C++ Language): Features of OOPs: Data abstraction, Data encapsulation, Inheritance Polymorphism, Dynamic binding, Message Passing ; Tokens, expressions, data types, variables, operators, Control statements, Constructors and destructors, Objects, Classes, Simple Programs based on abovementioned concepts.

References:

1. Kanetkar, Yashavant : Let us C, BPB Publications, New Delhi, 8th
2. Gottfried, B. : Theory and problems of Programming in C, Schaum Series.N.D. TMH
3. Sinha, P.K. : Computer Fundamentals, BPB Publications,
4. Salaria, R. S. : Application Programming in C; Khanna Book Publishing Co. (P) Ltd., New Delhi.
5. E. Balagurusamy : Object Oriented Programming with C++

Paper Title : COMPUTER BASED ACCOUNTING.

Paper Code : PGD-1003 **Max. Marks : 80** **Time : 3 Hrs.**
Course Duration : 60 Lectures of one hour each.
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.
2. **Final** Accounts: Trading, profit and loss accounts and balance sheet of sole proprietary concern with normal closing entries.

SECTION - B

3. **Introduction to Manufacturing Account,** final accounts of partnership firms, limited company.
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.

SECTION - C

5. **Introduction to Computerized 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.

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

SECTION - D

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

References :

1.	Kellock, J., 1972	:	Elements of Accounting, Heinemann 1st ed., London.
2.	Rockley, L.E., 1970	:	Finance for the Non-Accountant 2nd. Edition, London : Business Book.
3.	Levy and Sarnat, 1991	:	Principle of Financial Management, Prentice-Hall International, PHI.
4.	Arnold, 1984	:	Financial Accounting, Prentice-Hall International (Paperback Edition).
5.	Horngren and Sundem, 2010	:	Introduction to FinancialAccounting, Prentice-Hall International (Paperback Ediion) N.D: PHI.
6.	Murthy, U.S.	:	Management Finance, 2nd. 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, 6th Rev. ed., N. Delhi.

Paper Title : Software L ab.

Paper Code : PGD-PR01 **Max. Marks: 60** **Time: 4 Hrs.**

Objective: This course is to familiarize students with different O.S., Word Processing and UNIX.

DOS: Internal DOS commands such as DIR, COPY, TYPE, DEL, DATE, and External commands such as UNDELETE, DELTREE, XCOPY, MOVE, and SCANDISK.
Windows: GUI, Icons, Toolbar, Control panel, Explorer: Files and directory management under windows , Accessories, Network Neighborhood, System Tools, Recycle Bin, Installation of new software.
UNIX: Understanding Unix directory structure 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
Word Processing Software: Basics of Word Processing: creating, opening, saving, and printing document, using Menu Toolbars, editing Text (Copy, Delete, Move etc.), Finding and Replacing Text, Spell Check, Autocorrect feature; Formatting: Character, Paragraph and Page formatting, adding Headers and Footers, setting up Multiple Columns.
Spreadsheet Software: Row, Column, Cells, Menus, creating, opening, saving, and printing worksheet; working with Ranges, working with Formulae and Functions (Statistical, Mathematical and String), number formatting
Presentation Software: Basics features, selecting design templates, creating, saving and printing a simple presentation.

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

Paper Code: PGD-PR02 **Max. Marks: 60** **Time: 4 Hrs.**
This laboratory course will be based on paper **PGD-1002** (Computer Programming and Problem Solving).

SEMESTER -II

Paper Title: DATABASE MANAGEMENT SYSTEM Using SQL

Paper Code : PGD -2001 **Max. Marks : 80** **Time : 3 Hrs.**
Course Duration: 60 Lectures

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.

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.

SECTION - B

3. **Relational Model:** Storage organization for Relations, Relational Algebra, Relational Calculus, Functional dependencies, Multivalued dependencies, Normalisation.

4. **Database Security:** Database Integrity, Security, Concurrency, Recovery.

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 and Grouping the Result of a Query; ROLLUP Operation: Getting Sub Totals, CUBE Operation: Getting Cross Tabs, Command Summary of SQL *Plus Editor.

6. **Querying Multiple Tables and Functions:** Collating Information: Equi Joins, Cartesian Joins, Outer Joins, Self Joins; SET Operators: Union, Intersect, Minus; Nested Queries. Functions: Scalar Functions (Arithmetic Functions, Character Functions, Date Functions, General Functions); Group Functions.

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.

SECTION - D

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

9. **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.

References:

1.	Desai, B.C.	:	An Introduction to Database Systems, Galgotia Pub. New Delhi,
2.	Date, C. J.	:	Database Systems Vol. I & II, Narosa Publ., New Delhi (Indian student ed.)
3.	Henry F. Korth, Abraham,	:	Database System Concepts, McGraw Hill Inc., New York International ed.
4.	Mukhi, Vijay	:	Mastering Oracle, BPB Publication, NewDelhi
5.	James T. Perry	:	Understanding ORACLE, BPB Publications
6.	O'Reilly	:	Oracle PL/SQL Programming, Shroff Publications Mumbai
7.	Rowski, Bob	:	Oracle Client server Computing, BPB publications

Paper Title: WEB BASED APPLICATIONS AND ELECTRONIC COMMERCE.

Paper Code : PGD-2002 Max. Marks : 80 Time : 3 Hrs.
Course Duration: 60 Lectures of one hour each.

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

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

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, Inheritance: Basics, member access, method overloading, using abstract classes, using Final to prevent overriding/Inheritance,

SECTION - C

String Handling, Arrays, Packages and Interfaces: Defining a package, understanding CLASSPATH, Importing packages, Introduction to Interfaces, defining and using interfaces, Exception Handling: Fundamentals, exception types, using Try and catch, Introduction to Applet Programming.

SECTION - D

Electronic Commerce: Introduction, definition, Types of E-Commerce, H/W & S/W Requirements, E-Commerce Business Models, Benefits, Payment Systems, Steps involved in opening your own online business, Basic challenges to E-Commerce growth, Technological, Legal, Security and regulators Issues.

References :

1. Naughton, Patrick & Schidt, Herbert : Java The Complete Reference.,TMH
2. Phillips : Using HTML, PHI,
3. Liang : An Introduction to Java Programming by PHI, DHTML, New Delhi.
6. Elias M. Awad : Electronic Commerce: From Vision to Fulfillment, PHI New Delhi.
7. Ravi Kalakota, Andrew Whinston : "Frontiers of Electronic Commerce", Addision Wesley

Paper Title: DATA COMMUNICATIONS AND NETWORKS.

Paper Code : PGD-2003 **Max. Marks : 80** **Time : 3 Hrs.**
Course Duration: 60 Lectures of one hour each.
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

Introduction to Computer networks and applications: Network Structure and Architecture, Network Hardware and Software (protocol hierarchies, design issues for layers, interfaces and services: connection oriented and connection less), Network structure and architecture-point to point, multicast, broadcast, Classification of networks on the basis of Geographical Span (PAN, LAN, MAN and WAN) , LAN topologies (Bus, Ring, Star, Mesh, Tree and Hybrid). Network Connecting Devices: Repeaters, Hubs, Bridges, Routers, Gateways and Switches, Network Reference models: OSI model, TCP / IP model. Comparison between OSI and TCP/IP.

SECTION - B

Introduction to Data Communication: Analog Signal, Digital Signal, Analog vs Digital Communication; Fourier analysis, Band Width Limitation, Data rate of a channel; Physical Layer: Transmission media: Guided (Twisted-pair, Coaxial and Optical fiber) and Unguided (Radio, Microwave and infrared), Switching: Circuit switching, Packet Switching, Message Switching, Telephone system, modems. Modulation techniques: AM, PM, FM; Multiplexing Techniques: definition and Types.

SECTION – C

The Data Link Layer: Design Issues, Error Detection and Correction: Nature of errors, Parity Check, CRC, Hamming Code, Elementary Data Link Protocols: Simplex. Stop and Wait Protocol, Sliding Windows Protocol: one Bit sliding windows protocol, go back n, selective repeat, HDLC: High Level Data Link Protocol.

SECTION - D

The Network Layer: Design Issues, Routing Algorithms (Shortest Path, Flooding, Flow Based, Distance Vector, Link State, Broadcast, Hierarchical Routing), Congestion Control Algorithms and their general principles (Leaky Bucket, Token Bucket); Internetworking: tunneling, Internet Routing, fragmentation.

References :

1. Tanenbaum, Andrew S. : "Computer Networks", PHI.
2. Behrouz A. Forouzan "Data Communication & Networking", TMH
3. Stalling William Maxwell : "Data and Computer Communication", Macmillan International edition.
4. McGoven, Tom : "Data Communication: Concepts & Applications", (Prentice Hall).

Paper Title: DBMS Lab.

Paper Code: PGD-PR03 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: Web Programming Lab.

Paper Code: PGD-PR04 Max. Marks: 60 Time: 4 Hrs.

This laboratory course will be based on **PGD-2002.**

Paper Title: Project Work.

Paper Code: PGD-2004 Max. Marks: 100

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