

Bilaspur University, Bilaspur, Chhattisgarh  
Syllabus of PGDCA, w.e.f. academic session 2014-15

# **SCHEME OF EXAMINATION & DETAILED SYLLABUS**

**For**  
**POST GRADUATE DIPLOMA**  
**in**  
**COMPUTER APPLICATION**  
**(PGDCA)**



**BILASPUR UNIVERSITY**  
**Bilaspur, Chhattisgarh**

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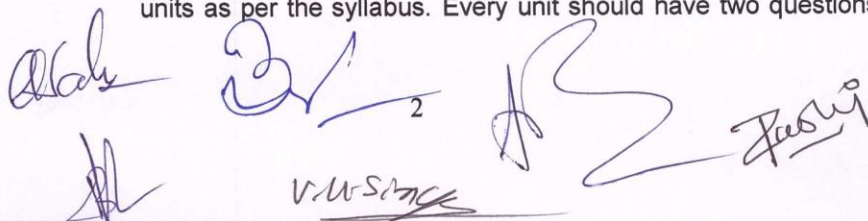
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## Structure & Syllabi for One Year PG Diploma Programme of P.G.D.C.A.

1. The title of the programme will be Post Graduate Diploma in Computer Application (P.G.D.C.A.) and will be introduced from the academic year 2014-15.
2. **Objectives:** The objectives of the Programme shall be to provide sound academic base for proceeding career in Computer Application.
3. **Eligibility for admission:** In order to be eligible for admission to PGDCA a candidate must be Graduate in any stream with minimum 40% marks in aggregate.
4. **Duration:** The duration of the P.G.D.C.A. Program shall be one year .
5. **The scheme of Examinations:** The P.G.D.C.A. Examination will be of 800 marks as given Below:
  - I) Theory Papers: 600 marks
  - II) Project and Practical Papers: 200 marks
6. **The Standard of Passing and Award of Class**

In order to pass in the examination the candidate has to obtain 40% marks out of 100. (Min 40% marks must be obtained in theoretical papers as well as practical papers of University Examination).

The class will be awarded on the basis of aggregate marks obtained by the candidate for examinations.
7. The Medium of Instruction and Examination (Written and Viva ) shall be English/Hindi.
8. **Instructions to Paper Setters:**
  - a. In each theory paper, six questions are to be set and paper have maximum 100 marks. Question paper should be in English as well as Hindi.
  - b. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 30 marks.
  - c. Apart from Question No. 1, rest of the paper shall consist of five units as per the syllabus. Every unit should have two questions.



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However, student may be asked to attempt only 1 question from each unit. Each question should be 14 marks.

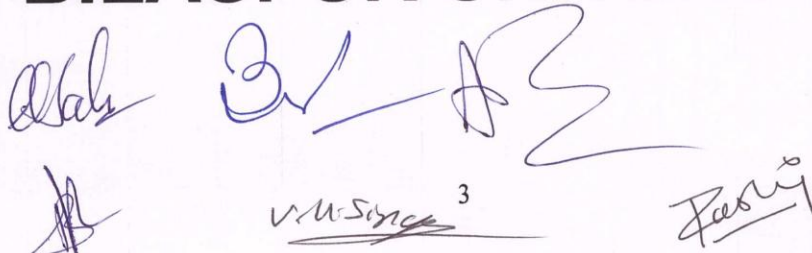
9. The Yearly plan of the programme shall be as follows :

## YEAR WISE PLAN

### PGDCA

Subject Code	Subject Name	Subject Nature	End Semester Examination Maximum Marks	End Semester Examination Minimum Passing Marks
PGDCAT-101	Fundamentals of Computer and Information Technology	Theory	100	40
PGDCAT-102	PC-Packages and Computerized Accounting System	Theory	100	40
PGDCAT-103	Data communication and Computer Network	Theory	100	40
PGDCAT-104	Programming using 'C' & C++	Theory	100	40
PGDCAT-105	Relational Database Management System (Oracle)	Theory	100	40
PGDCAT-106	System Analysis and Design	Theory	100	40
PGDCAP-107	PC Package and Tally ERP Lab	Practical	50	17
PGDCAP-108	C, C++ and Oracle Lab	Practical	50	17
PGDCAP-109	Project	Project	100	40
Total Marks PGDCA Examination			800	

## BILASPUR UNIVERSITY

  
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# Detailed Syllabus For (PGDCA)

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## PGDCAT-101

### FUNDAMENTALS OF COMPUTER AND INFORMATION TECHNOLOGY

#### UNIT-I

Introduction to Computer and Information Technology: Brief history of development of computer & Generations of computers Computer system characteristics. Capabilities and limitations block diagram of computer. Types of computers-Analog, Hybrid, digital, micro, Mini, Mainframe, Super computer. Personal Computer, Types of PCs desktop, Laptop, Notebook, Palmtop etc. Number system Data representation in computers. Numbers System of computers binary, Octal, Hexadecimal, Representation & their conversion. Coding System ASCII, BCD, EBCDIC etc.

#### UNIT-II

INPUT/OUTPUT devices: Keyboard, Mouse, monitor, Trackball, Joystick, Digitizing table, Scanners, Digital Cameras, MICR, OCR, OMR, Bar-code Reader, Voice Recognition, Light pen, touch Screen, devices, printer, plotter.

#### UNIT-III

Storage Device : Data Storage and Retrieval methods-Sequential, Direct and index Sequential-Variou Storage Devices-Magnetic tape, Magnetic Disks, Cartridge Tape, Data Drives, Hard Disk Drives, Floppy Disks, Optical Disks-CD, VCD, CDR, CDRW, DVD.

#### UNIT-IV

Computer Software: Types of Software, System Software, Application software, Operating System, Utility program, Assemblers, Compilers and Interpreter. Operating System functions, types Batch, Single User, multi user, multiprogramming, multiprocessing. Programming languages, machine, assembly, high level, 4GL, their merits and demerits. Computer Virus - Types of Virus, Virus detection & prevention Virus on network.

#### UNIT-V

Data Communication And Networks: analog and digital signals, Modulations, amplitude modular (am), frequency modulation (fm), phase modulation (pm), communication process, direction of transmission flow, simplex, half duplex, full

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duplex.Types of network LAN, WAN, MAN etc. Topologies of LAN ring, bus, star, mesh and tree topologies, communication protocols TCP/IP protocol suit. Communication channels media twisted, coaxial fiber optic, serial and parallel communication. Network operating system (NOS) , bridges, hub, routers, repeater and gateways. Modem working and characteristics. Types of connections- dialup leased lines, ISDN, broadband.

**TEXT & REFERENCE BOOKS:**

1. Computer Fundamentals, P. K. Sinha, BPB
2. Computers Today by S.K. Basandra Galgotia Publications.
3. Fundamentals of Information by Alexos Leon & Mathews Leon, Vikas Publishing House, New Delhi.

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**PGDCAT-102**

**PC-PACKAGES AND COMPUTERIZED ACCOUNTING SYSTEM.**

**UNIT-I**

Fundamental of Dos & Windows: Fundamental of DOS booting process, internal and external commands, creating and executing batch files and directories creating text files. Introduction to windows features, various versions of windows, origin of windows parts of windows screen types and anatomy of windows using.

**UNIT-II**

Introduction to Word Processing (Ms-Word): Advantages of Word Processing, Editing a File using Paragraphs, bullets, indentation etc. Formatting features, Printing the documents, it includes paper-size, margins, header and footer, page no, using Macros. Advance Word Processing, Header & Footers. Finding Text, Mail merge And Other Application, Mathematical Calculations, Table handing.

**UNIT-III**

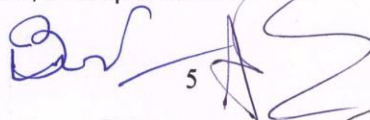
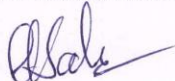
Introduction to Spread sheet (Ms-Excel): Definition and advantages of electronic worksheet, working on spread sheet, range and related operations. setting saving and retrieving work sheet file, inserting deleting coping & moving of data cells, inserting and deleting rows & columns , protecting cells printing a worksheet, erasing a worksheet, graphs : creation , types of graphs creating a chart sheet 3d column charts, moving and changing the size of chart , printing the chart.

**UNIT-IV**

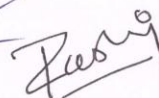
Introduction to Powerpoint (Ms-Powerpoint): Creating a presentation, Inserting/Deleting slides, Different slide views, Editing slides. Slide transition & editing special effects Inserting sound, picture, chart, organization chart.

**UNIT-V**

Accounting Software Tally ERP 9: Basic principles of double entry accounting system, creating new company, security controls, groups, ledger, voucher type, modifying, new company, voucher entry, generating profit & loss account, trial balance and balance sheet, backup & restore.



V. A. Singh



**TEXT & REFERENCE BOOKS:**

1. Comdex Computer Course Kit ( windows 7 with office 2010), Gupta Vikas, Dreamtech Publication
2. Mastering MS Office 2007, Courter, BPB Publication.
3. MS Office 2007 Training Guide, Maria, BPB Publications.
4. PC Software, Ravi Taxalli, BPB.
5. Computer Fundamental By P.K. Sinha
6. Financial Accounting With Tally 9.001 edition by Vikas Gupta.
7. Mastering Tally... ERP 9 By A.K Nandhani.

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**PGDCAT-103**

**DATA COMMUNICATION AND COMPUTER NETWORK**

**UNIT-I**

Introduction to Data Communication – Network Models, Protocols and Architecture, Standards Organizations, Line Configuration, Topology, Transmission Mode, Classification of Networks, OSI Reference Model, TCP/IP Model

**UNIT-II**

Analog and Digital Signals. Data Encoding, Parallel and Serial Transmission, Modems, Transmission Media: Guided Media, Unguided Media, Transmission Impairment, Performance. Synchronous and Asynchronous transmission.

**UNIT-III**

Multiplexing, LLC, Error Detection and Correction, Flow Control, HDLC, LANs- Applications, Architecture, Ethernet, 802.3 LANs, Token Ring, FDDI, IEEE 802.6, Circuit Switching, Packet Switching, Message Switching, Connection Oriented and Connectionless Services.

**UNIT-IV**

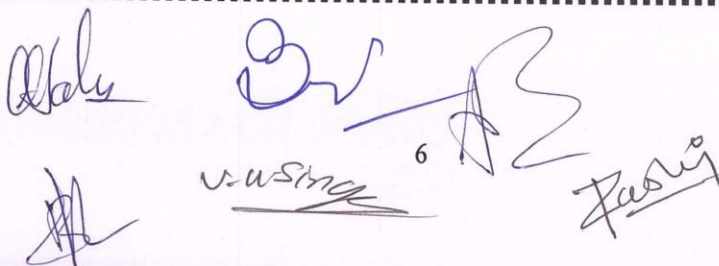
Principles of Internetworking- Connection-Oriented, Connectionless.. Routing Concepts, Routing Algorithms – Distance-vector routing, Link state routing, shortest Path routing. Congestion Control, QoS, Internetworking, Network Devices

**UNIT-V**

Network Security Requirements and Attacks, Public Key and Private Key Encryption and Digital Signatures, Digital Certificate, Firewalls, IDS (Intrusion Detection system).

**TEXT & REFERENCE BOOKS:**

1. Computer Networks – A. S. Tanenbaum. PHI
2. Data Communications and Networking – Behrouz A. Forouzan. TMH

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## **PGDCAT-104 SYSTEM ANALYSIS AND DESIGN**

### **UNIT-I**

The System Concept : Characteristics, Elements and types of a system, The System Development Life Cycle, Considerations for candidate systems, prototyping, The Role of System Analyst.

### **UNIT-II**

System planning and Initial Investigation: Information Gathering, information gathering tools. Structured Analysis, The tools of Structured analysis (DFD, Data Dictionary, Decision tree and Pseudo Codes, Decision Tables), PROS and CONS of each tool, System performance definition, description of outputs, feasibility study. Cost/Benefit Analysis, Data analysis, Cost/Benefit Analysis, The system proposal.

### **UNIT-III**

Stages of system design: Design methodologies, development activities, Input design, output design forms design, types of forms, basics of form design layout considerations and forms control.

### **UNIT-IV**

File structure: File organization, objectives of database, data structure, system testing and quality assurance, why system testing, what do we test for, the test plan quality assurance, trends in testing, role of data processing auditor, training and documentation.

### **UNIT-V**

Implementing and software maintenance: Conversion combating resistance to change, post implementation review, software maintenance, hardware/software selection and the computer contract, suppliers, procedure for hardware/software selection, financial considerations in selection, the computer contract system security disaster recovery planning.

### **TEXT & REFERENCE BOOKS**

1. System Analysis and Design, Elias M. Awad, Galgotia Publications (P) Ltd.
2. System Analysis and Design, International Ed. Perry Edwards, McGraw Hill Pub.

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## **PGDCAT-105 PROGRAMMING USING C & C++**

### **UNIT-I**

Introduction to 'C language: Fundamentals, Simple I/O statements, reading and writing, Data Types, Constants, Variables, Operators & Expressions, Library functions, Control Statements, if-else, while, do-while, goto, for statements, switch, break, Looping statements, Functions, recursion, Arrays, multidimensional arrays, strings & Pointers.

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#### UNIT-II

Programming in C++, Functions, Class, Object, Constructor and Destructor: Call by reference, call by value, return by reference, inline function, constant argument, function overloading, static member function, static data member. Classes: Implementing class, Classes and members, Accessing class members, implementing class methods, array of object, friend function. Constructor & destructors : Parameterized constructor, multiple constructor, constructor with default argument, copy constructor, destructor.

#### UNIT-III

Operator Overloading & Type Casting: Operator overloading, unary operator overloading, binary operator overloading, manipulates string using operator overloading, type conversions : basic to class, class to basic, class to class.

#### UNIT-IV

Inheritance, Virtual Function: Single Inheritance, multilevel inheritance, multiple Inheritance, hybrid Inheritance, hierarchical Inheritance, virtual base class, abstract class.

#### UNIT-V

Pointers & File: pointer to object, this pointer, virtual function and pure virtual function. File: opening and close file, detecting end of the file.

#### TEXT & REFERENCE BOOKS:

1. Let us C by Yaswant Kanetkar BPB.
2. Object Oriented Programming with c++, E. Blagurusamy, Tata McGraw Hill.
3. C++ Complete Reference, Herbert Schildt, TMH.
4. ANSI C Programming, E. Balaguruswamy, TMH

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## PGDCAT-106 RELATIONAL DATABASE MANAGEMENT SYSTEM ( ORACLE )

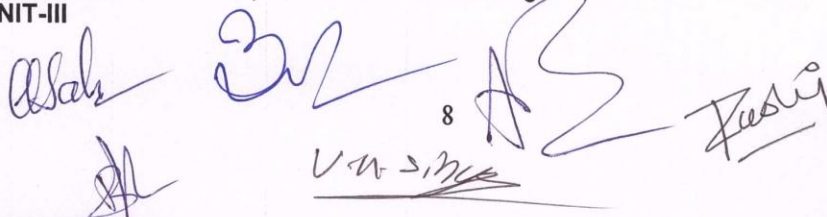
#### UNIT-I

Overview of Database Management: Data, Information , data independence, database administration roles, DBMS architecture, different kinds of DBMS users, importance of data dictionary, contents of data dictionary, types of database languages. Data models: network, hierarchical, relational. Introduction to distributed databases, Client/Server databases, Object-relational databases, Introduction to ODBC concept.

#### UNIT-II

Relational Model: Entity Relationship model as a tool for conceptual design-entities attributes and relationships. ER diagrams; Concept of keys: candidate key, primary key, alternate key, foreign key; Strong and weak entities, Case studies of ER modeling Generalization; specialization and aggregation. Converting an ER model into relational Schema. Extended ER features, Introduction to UML, Representation in UML diagram.

#### UNIT-III

  
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Structured Query Language(SQL): Relational Algebra: select, project, cross product different types of joins (inner join, outer joins, self join); set operations, Tuple relational calculus, Domain relational calculus, Simple and complex queries using relational algebra, stand alone and embedded query languages, Introduction to SQL constructs (SELECT...FROM , WHERE... GROUP BY... HAVING... ORDERBY....), INSERT, DELETE, UPDATE, VIEW definition and use, Temporary tables, Nested queries, and correlated nested queries, Integrity constraints: Not null, unique, check, primary key, foreign key, references, Triggers.

**UNIT – IV**

Relational Database Design: Normalization concept in logical model; Pitfalls in database design, update anomalies: Functional dependencies, Join dependencies, Normal forms (1NF, 2NF, 3NF). Boyce Codd Normal form, Decomposition, Multi-Valued Dependencies, 4NF, 5NF. Issues in physical design; Concepts of indexes, File organization for relational tables, De-normalization, Clustering of tables, Clustering indexes.

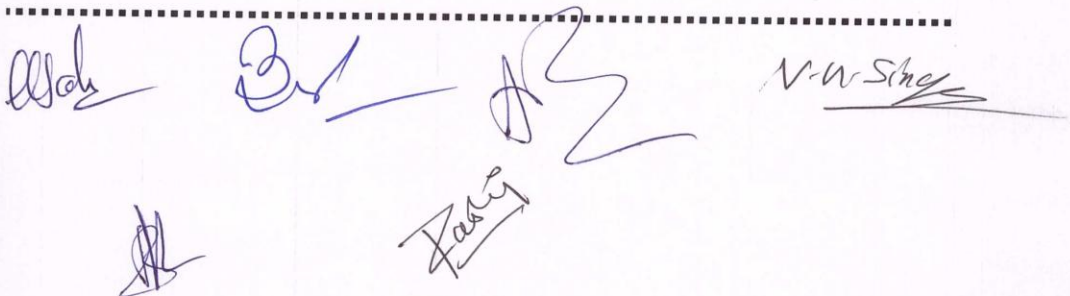
**UNIT-V**

Introduction to Query Processing and Protecting the Database: Parsing, translation, optimization, evaluation and overview of Query Processing. Protecting the Database Integrity, Security and Recovery. Domain Constraints, Referential Integrity, Assertion, Triggers, Security & Authorization in SQL.

**TEXT & REFERENCE BOOKS:**

1. Database system concept , H. Korth and A. Silberschatz, TMH
2. Data Base Management System, C. J. Date, Narosha Pub.
3. An Introduction to database systems - Bipin Desai, Galgotia Publication.
4. SQL, PL/SQL Evan Bayross (2nd edition) BPB Publications .

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**PGDCAP-107**

**PC Package and Tally ERP Lab**

Note: Practical should be as per syllabus of theoretical paper.

**PGDCAP-108**

**C, C++ and Oracle Lab**

Note: Practical should be as per syllabus of theoretical paper.

**PGDCAP-109**

**PROJECT**

Note:

1. It is compulsory, that students would have group of maximum of two students and project should be done under Government Sectors/ Public Sector / Pvt. Limited S/W Company/ Software Technology Park of India/ ISO 9001 certified company etc.
2. The students should not make any project under local or private institutions.
3. The students should make project themselves and project will not be copy of other project.

**Steps for Live Project**

1. Getting customer's requirements
2. designs, database and business logics
3. Developing software application project
4. Testing and implementing the project
5. Troubleshooting the project application after implementation

The break-up of marks for Practical will be as under :

Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	10	
2.	Viva-voce	20	
3.	Program Development and Execution	20	
Total Marks		50	17



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The break-up of marks for Project will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Project Report	25	
2.	Viva-voce/ Presentation	25	
3.	Project Execution	50	
Total Marks		100	40

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Dr

V.N. Singh

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