# FACULTY OF COMPUTER SCIENCE & IT

**SYLLABUS FOR**

**Post Graduate Diploma in Computer Applications**

**(Semester I-II)**

**Under Credit Based Continuous Evaluation Grading System**

**(CBCEGS)**

**Session: 2024-25**

# The Heritage Institution

# KANYA MAHA VIDYALAYA JALANDHAR (Autonomous)

# Post Graduate Diploma in Computer Applications

## (Session 2024-25)

## PROGRAMME SPECIFIC OUTCOMES

Upon successful completion of Post Graduate Diploma in Computer Applications course, the students will be able to:

**PSO1:** Get familiar with computer fundamentals and able to work with office automation software.

**PSO2:** Perform various Creative Design applications like photoshop & CorelDraw to design banners/logos and also use these skills in photo editing.

**PSO3:** Comprehend different types of Operating Systems, networking and scripting language concepts.

**KANYA MAHA VIDYALAYA, JALANDHAR (AUTONOMOUS)**

**SCHEME AND CURRICULUM OF EXAMINATIONS OF ONE YEAR POST GRADUATE DIPLOMA**

**Post Graduate Diploma in Computer Applications**

**Credit Based Continuous Evaluation Grading System (CBCEGS)**

**(Session 2024-25)**

| **Post Graduate Diploma in Computer Applications Semester - I** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Course Code** | **Course Title** | **Course Type** | **Hours Per Week L-T-P** | **Credits** | | **Marks** | | | | **Examination time (in Hours)** |
| | | | | **L-T-P** | **Total** | **Total** | **Th** | **P** | **CA** | |
| PCAL-1111 | PC Computing-I **(**Back Office Operations**)** | C | 4-0-0 | 4-0-0 | 4 | 100 | 70 | - | 30 | 3 |
| PCAL-1112 | Internet and Web Designing | C | 4-0-0 | 4-0-0 | 4 | 100 | 70 | - | 30 | 3 |
| PCAL-1113 | Fundamentals of Computer and Operating System | C | 4-0-0 | 4-0-0 | 4 | 100 | 70 | - | 30 | 3 |
| PCAL-1114 | Programming in Python | C | 4-0-0 | 4-0-0 | 4 | 100 | 70 | - | 30 | 3 |
| PCAP-1115 | Lab on PC Computing-I and Web Designing | C | 0-0-4 | 0-0-2 | 2 | 50 | - | 35 | 15 | 3 |
| PCAP-1116 | Lab on Programming in Python | C | 0-0-4 | 0-0-2 | 2 | 50 | - | 35 | 15 | 3 |
| **TOTAL CREDITS** | | | | 20 | | 500 | | | | |

**Note: C- Compulsory Course**

**KANYA MAHA VIDYALAYA, JALANDHAR (AUTONOMOUS)**

**SCHEME AND CURRICULUM OF EXAMINATIONS OF ONE YEAR POST GRADUATE DIPLOMA**

**Post Graduate Diploma in Computer Applications**

**Credit Based Continuous Evaluation Grading System (CBCEGS)**

**(Session 2024-25)**

| **Post Graduate Diploma in Computer Applications Semester – II** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Course Code** | **Course Title** | **Course Type** | **Hours Per Week L-T-P** | **Credits** | | **Marks** | | | | **Examination time (in Hours)** |
| | | | | **L-T-P** | **Total** | **Total** | **Th** | **P** | **CA** | |
| PCAL-2111 (Option (I)) | Introduction to Cyber Security | O | 4-0-0 | 4-0-0 | 4 | 100 | 70 | - | 30 | 3 |
| PCAL-2112 | Network Concepts | C | 4-0-0 | 4-0-0 | 4 | 100 | 70 | - | 30 | 3 |
| PCAL-2113 | Database Management System | C | 4-0-0 | 4-0-0 | 4 | 100 | 70 | - | 30 | 3 |
| PCAP-2114 | Lab on PC Computing-II (Professional DTP) | C | 0-0-4 | 0-0-2 | 2 | 50 | - | 35 | 15 | 3 |
| PCAP-2115 | Lab on Database Management System | C | 0-0-4 | 0-0-2 | 2 | 50 | - | 35 | 15 | 3 |
| PCAD-2116 | Minor Project | C | 0-0-8 | 0-0-4 | 4 | 100 | - | 70 | 30 | 3 |
| **TOTAL CREDITS** | | | | 20 | | 500 | | | | |

**List of Optional PCAL-2111:**
Option (I): Introduction to Cyber Security
Option (II): E-Commerce

**Note:**
**C- Compulsory Course**
**O-Optional Course**

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – I**

**Session 2024-25**

# PC COMPUTING-I
# (BACK-OFFICE OPERATIONS)
# COURSE CODE: PCAL–1111

**Course Outcomes:**

After passing this course the student will be able to:

CO1: Comprehend basic word processing skills such as text input formatting, editing, cut, copy, paste, spell check, margin, tab controls, keyboard shortcuts, printing, charts, etc.

CO2: Apply skills to make effective presentations using associated application software.

CO3: Apply animations, transitions, multimedia and graphs on presentations.

CO4: Manage data in a spreadsheet along with its representation through graphs and charts.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – I**

**Session 2024-25**

**PC COMPUTING-I**
**(BACK-OFFICE OPERATIONS)**
**COURSE CODE: PCAL–1111**

**Examination Time: 3 hours** **Max. Marks: 100**
**Theory: 70**
**L:T:P: 4:0:0** **CA: 30**
**Credit: 4**

**Instructions for Paper Setter -**

Eight questions of equal marks (14 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section.

**UNIT I**

**Word Processing**: Introduction to word processing & its features, parts of window of word processing (Title bar, menu bar, status bar, and ruler), understanding the ribbon, creation of new documents, opening document, insert a document into another document. Page setup, margins, gutters, font properties, alignment, page breaks, header & footer, deleting, moving, replace, editing text in document, saving a document, spell checker, printing a document.

**UNIT II**

**Word Processing**: Creating a table, entering and editing text in tables, changing format of table, height and width of row/column editing, adding and deleting rows/columns. Adding picture, page colors and watermarks, borders, shading, drawing objects.

**Presentation:** Introduction to presentation, exploring menus, starting a new slide, saving presentation, moving/rearranging slides, printing slides.

**UNIT III**

**Presentation:** Applying theme to presentation, views (slide view, slide sorter, notes view, outline view), formatting & enhancing text. Creating a graph, displaying slide show, adding multimedia. Slide transitions, applying Animation, Timing slide display, adding movies & sounds, using a pick look wizard to change format.

## UNIT IV

**Spreadsheet**: Introduction to worksheet/spreadsheet, features, creating a new workbook, different functions on different data in excel, creation of graphs, editing it and formatting, changing chart type to 2D chart or 3D chart, pivot table, creation of worksheet, adding, deleting, moving the text in worksheet, linking different sheets, sorting the data, querying the data, filtering the data (auto and advance filters), What-if analysis, open an already existing workbook, saving workbook, printing a worksheet, closing the workbook & exiting.

**References:**


1. *AnshumanSharma, A book of Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.*
2. *Prof. Satish Jain, M. Geetha, Kratika, BPB's Office 2010 Course Complete Book,BPB Publications, 2017.*

*3.Joyce Cox, Joan Lambert and Curtis Frye, Microsoft office Professional 2010 Step by Step, Microsoft Press, 2010.*

*4.V. Rajaraman, NeeharikaAdabala, Fundamentals of Computers, PHI Learning, 2015.*

*5.P.K. Sinha,Computer Fundamentals, BPB Publications, 2004.*


Note: The latest editions of the books should be followed.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – I**

**Session 2024-25**

**INTERNET AND WEB DESIGNING**

**COURSE CODE: PCAL–1112**

**Course Outcomes:**
After passing this course the student will be able to:

CO1: Comprehend basics of internet and emails.
CO2: Create static webpages using HTML.
CO3: Apply styling to static webpages using different CSS properties.
CO4: Implement styling and behavior in webpages through the use of JavaScript.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – I**

**Session 2024-25**

**INTERNET AND WEB DESIGNING**
**COURSE CODE: PCAL–1112**

**Examination Time: 3 hours** **Max. Marks: 100**
**Theory: 70**
**L:T:P: 4:0:0** **CA: 30**
**Credit: 4**

**Instructions for Paper Setter -**
Eight questions of equal marks (14 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

**UNIT I**

**INTERNET:** Introduction to Internet, Types of Internet Connectivity, File Transfer Protocol, HTTP, Introduction to WWW, Working of WWW, Web browsing (opening, viewing, saving and printing a web page and bookmark).
**E–MAIL BASICS:** Introduction, advantage and disadvantage, structure of an email message, working of e–mail (sending and receiving messages), managing email (creating new folder, deleting messages, forwarding messages, filtering messages.

**UNIT II**

**HTML:** Structure of HTML, Basic Tags, Image, Hyperlinks, Marquee, Frames, Tables, Lists, Forms, Limitations of HTML.

**UNIT III**

**CSS –** Introduction, Stylesheets, Syntax, Classes & ID's, Background, Text properties, Box model, Font properties, list, border, margin, padding, table, Class properties, Position properties, Links.

**UNIT IV**

**JavaScript –** Basics, variables, Functions, popup boxes, Conditions and loops, arrays, objects, strings, events, errors, DOM, elements, cookies.

**References/Textbooks:**


1. *Jeffrey C Jackson, Web Technology- A Computer Science perspective, Pearson Education (2007) 1st ed.*
2. *Chris Bates, Web Programming- Building Internet Applications, Wiley India (2006), 3rd ed.*
3. *Achyut S Godbole and Atul Kahate, Web technologies, Tata McGraw Hill (2002), 2nd ed.*
4. *Uttam K Roy, Web Technologies, Oxford University Press (2010), 1st ed.*
5. *Anshuman Sharma, Fundamentals of Internet Applications, Lakhanpal Publishers (2016), 1st ed.*

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – I**
**Session 2024-25**

**FUNDAMENTALS OF COMPUTER AND OPERATING SYSTEM**
**COURSE CODE: PCAL–1113**

**Course Outcomes:**
After passing this course the student will be able to:

CO1: Comprehend the basic components and functional units of a computer system.

CO2: Identify various input, output and memory devices.

CO3: Describe, contrast and compare different types of Operating System.

CO4: Create folder, shortcuts and manage files in Windows.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – I**

**Session 2024-25**

**FUNDAMENTALS OF COMPUTER AND OPERATING SYSTEM**
**COURSE CODE: PCAL–1113**

**Examination Time: 3 hours** **Max. Marks: 100**
**Theory: 70**
**L:T:P: 4:0:0** **CA: 30**
**Credit: 4**

**Instructions for Paper Setter -**
Eight questions of equal marks (14 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

**UNIT I**

**Fundamentals of Computer:** Introduction to computer, Applications of computer, Components of computers (Input unit, Output Unit, Memory Unit & CPU), Types of software- System Software, Application Software.
**Input Devices:** Keyboards, Mouse, Joystick, Track Ball, Light Pen

**UNIT II**

**Data Scanning Devices-** scanner, OCR, OMR, MICR, Bar Code Reader, Card Reader)

**Output Devices:** Monitor, Printers (laser printer, dot-matrix printer, ink jet printer)

**Memories:** Primary Memory (RAM & ROM) & Secondary Memory (Hard Disk, CD, DVD)

**UNIT III**

**Introduction** to Operating System, Types of Operating systems: Multiuser, Multitasking and Multiprogramming, Functions of Operating System, Booting a System, Language Processors: Compiler, Assembler, Interpreter, Linker and Loader.

**UNIT IV**

**Introduction to Windows:** Parts of window screen (Desktop, window, icons), start menu, Taskbar settings, application & document window, anatomy of a window (Title bar, minimize, maximize button, control box, scroll bars, scroll buttons, scroll boxes), Window explorer (expansion,

copying, moving, deleting files, folder, creating folders), About desktop icons (recycle bin, my computer, network neighborhood, briefcase), folder, shortcut creation, setting of screen saver, color settings, changing window appearance.

**References/Textbooks:**


1. *Anshuman Sharma, Fundamentals of Information Technology, Lakhanpal Publishers, 5th Edition.*
2. *Rachhpal Singh &Gurvinder Singh, PC Software, Kalyani Publisher, 2009.*
3. *Peter Norton, Peter Norton's Computing Fundamentals, McGraw-Hill Technology Education, 2006.*


Note: The latest editions of the books should be followed.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – I**

**Session 2024-25**

**PROGRAMMING IN PYTHON**
**COURSE CODE: PCAL–1114**

**Course Outcomes:**

After passing course the student will be able to:

CO1: Comprehend basics of Python programming like operators, data types, control structures, etc.

CO2: Apply list and directories for handling and accessing data through iterations.

CO3: Implement various built-in and user defined function to solve mathematical problems.

CO4: Comprehend Object Oriented Programming and modules in Python.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – I**

**Session 2024-25**

**PROGRAMMING IN PYTHON**
**COURSE CODE: PCAL–1114**

**Examination Time: 3 hours** **Max. Marks: 100**
**Theory: 70**
**L:T:P: 4:0:0** **CA: 30**
**Credit: 4**

**Instructions for Paper Setter -**

Eight questions of equal marks (14 Marks each) are to set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

**UNIT-I**

**Introduction to Python:** Process of Computational Problem Solving, Python Programming Language

**Data and Expressions:** Literals, Variables and Identifiers, Operators, Expressions, Statements and Data Types

**Control Structures:** Boolean Expressions (Conditions), Logical Operators, Selection Control, Nested conditions, Debugging

**UNIT-II**

**Lists:** List Structures, Lists (Sequences) in Python, Iterating Over Lists (Sequences) in Python
**Dictionaries**: Dictionaries and Files, Looping and dictionaries, advanced text parsing
**Iteration:** While statement, definite loops using For, Loop Patterns, Recursive Functions, Recursive Problem Solving.

**UNIT-III**

**Functions:** Fundamental Concepts, Program Routines, Flow of Execution, Parameters & Arguments
**Files:** Opening Files, Using Text Files, String Processing.

**UNIT-IV**

**Objects and Their Use:** Introduction to Object Oriented Programming
**Modular Design:** Modules, Top-Down Design, Python Modules

**References/Textbooks:**


1. Charles Severance, Python for Informatics, Version 0.0.7.
2. Charles Dierbach, Introduction to Computer Science Using Python: A Computational Problem-SolvingFocus, Wiley Publications, 2012.
3. Guttag John V, Introduction To Computation And Programming Using Python, PHI, 2014.
4. Jeeva Jose and Sojan P. Lal, Introduction to Computating& Problem Solving Through Python, Khanna Publishers, 2015.
5. Mark J. Guzdial, Introduction to Computing and Programming in Python, PearsonEducation, 2015.
6. Kenneth Lambert, Fundamentals of Python, Course Technology, Cengage Learning, 2015
7. Mark Lutz, Learning Python, O'Reilly Media, 2013


Note: The latest editions of the books should be followed.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – I**

**Session 2024-25**

**LAB ON PC COMPUTING-I AND WEB DESIGNING**

**COURSE CODE: PCAP–1115**

**Examination Time: 3 hours** **Max. Marks: 50**

**Practical: 35**

**L:T:P: 0:0:2** **CA: 15**

**Credit: 2**

Lab on PC Computing-I (Back- Office Operations) and Web Designing.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – I**

**Session 2024-25**

**LAB ON PROGRAMMING IN PYTHON**

**COURSE CODE: PCAP–1116**

**Examination Time: 3 hours** **Max. Marks: 50**

**Practical: 35**

**L:T:P: 0:0:2** **CA: 15**

**Credit: 2**

Lab on Programming in Python.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

**(Option-i): INTRODUCTION TO CYBER SECURITY**
**COURSE CODE: PCAL–2111**

**Course Outcomes:**

After passing this course the student will be able to:

**CO1:** Comprehend technical aspects of Wi-Fi and web browser security.

**CO2:** Apply techniques to secure social media and smartphones.

**CO3:** Comprehend various payment methods and ways to secure them.

**CO4:** Comprehend various cybersecurity threat and their corresponding counter measures.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

**(Option-i): INTRODUCTION TO CYBER SECURITY**
**COURSE CODE: PCAL–2111**

**Examination Time: 3 hours** **Max. Marks: 100**
**Theory: 70**
**L:T:P: 4:0:0** **CA: 30**
**Credit: 4**

**Instructions for Paper Setter -**
Eight questions of equal marks (14 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

## UNIT I

**Introduction to Cyber Space:** History of Internet, Cyber Crime, Information Security, Computer Ethics and Security
**Choosing the browser according to the requirement and email security:** Guidelines to choose web browsers, Securing web browser, Antivirus, Email security
**Guidelines for secure password and wi-fi security:** Guidelines for setting up a Secure password, Two-steps authentication, Password Manager, Wi-Fi Security.

## UNIT II

**Social Media and basic Windows security:** Guidelines for social media security, Tips and best practices for safer Social Networking, Basic Security for Windows, User Account Password,
**Smartphone security guidelines:** Introduction to mobile phones, Smartphone Security, Android Security, IOS Security
**Cyber Security Initiatives in India:** Counter Cyber Security Initiatives in India, Cyber Security Incident Handling, Cyber Security Assurance

## UNIT III

**Payment Security:** Online Banking Security, Mobile Banking Security, Security of Debit and Credit Card, UPI Security, Security of Micro ATMs, e-wallet Security Guidelines, Security Guidelines for Point of Sales(POS).
**Social Engineering:** Social Engineering, Types of Social Engineering.

## UNIT IV

**Cyber Security Threat:** Landscape and Techniques, Firewall, Sections of IT Act dealing with security, Hackers-Attacker-Countermeasures, Web Application Security, Digital Infrastructure Security.

**References:**


1. Introduction to Cyber Security - http://uou.ac.in/foundation-course
2. Fundamentals of Information Security - http://uou.ac.in/progdetail?pid=CEGCS-17
3. Cyber Security Techniques - http://uou.ac.in/progdetail?pid=CEGCS-17
4. Cyber Attacks and Counter Measures: User Perspective - http://uou.ac.in/progdetail?pid=CEGCS-17
5. Information System - http://uou.ac.in/progdetail?pid=CEGCS-17


Note: The latest editions of the books should be followed.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

**(Option-ii): E-COMMERCE**

**COURSE CODE: PCAL–2111**

**Course Outcomes:**

After passing this course the student will be able to:

CO1: Comprehend the basic terms of E-Commerce and acquaint about the steps to be followed for opening a new E-Commerce business.

CO2: Comprehend components and working of EDI.

CO3: Identify Electronic Payment systems, various issues involved in relation to secure electronic transactions and various E-Payment options.

CO4: Comprehend BPR and Case Studies of E-Business related applications.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

**(Option-ii): E-COMMERCE**
**COURSE CODE: PCAL–2111**

**Examination Time: 3 hours** **Max. Marks: 100**
**Theory: 70**
**L:T:P: 4:0:0** **CA: 30**
**Credit: 4**

**Instructions for Paper Setter -**
Eight questions of equal marks (14 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

**UNIT – I**

**Introduction to E – Commerce:** Meaning and Concept, Features, Benefits, E-Commerce v/s. Traditional Commerce. E-Commerce Framework, VAN and EDI as Promoters. E-Commerce Models.

Steps involved in opening your own online business, Role of Website and the technologies needed to build a website.

**UNIT - II**

**EDI:** EDI Vs Traditional Systems, components and working of EDI system, EDI implementation issues, Factors for successful EDI Implementation, EDI service providers in India.

**UNIT – III**

**Concerns for E – Commerce:** Legal and regulatory issues, Laws for E – Commerce, E-Commerce in India, Sections of IT Act for E-Commerce transactions.

**Electronic Payment Systems**: Various Methods of Electronic Payments – Google pay, Paytm, Debit and Credit Cards, UPI. E-Commerce security Issues and Measures.

**UNIT – IV**

**Re – Engineering for Change:** Business process re – engineering (BPR), Methodology and Planning Methods for change.

**Case Studies:** To demonstrate usefulness of E – Commerce in various business areas like Banks, Reservations, E–Governance and E-Retailing.

**References:**


1. *K.K. Bajaj, Debjani Nag, E-Commerce –The Cutting Edge of Business, McGraw Hill Education; 2nd edition , 2017*
2. *Chaffey, E-Business and E-Commerce Managemet: strategy, Implementation and Practice, Pearson Education India (2013), 5th Edition*
3. *Kenneth C. Laudon and Carol Guercio Traver, E-Commerce, Pearson (2018), 13th Edition*
4. *S.J. P.t. Joseph, E-Commerce: An Indian Prespective, PHI Learning Pvt. Ltd. 6th Revised Edition, 2019*
5. *Shruti Mathur, Ecommerce, Pinnacle Learning (2020)*

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

**NETWORK CONCEPTS**
**COURSE CODE: PCAL–2112**

**Course Outcomes:**

After passing this course the student will be able to:

CO1: Describe the functions of each layer in OSI and TCP/IP model.

CO2: Identify various internetworking devices and also understand analog and digital transmission.

CO3: Describe the Data Link layer design issues.

CO4: Comprehend the Network Addressing.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

**NETWORK CONCEPTS**
**COURSE CODE: PCAL–2112**

**Examination Time: 3 hours** **Max. Marks: 100**
**Theory: 70**
**L:T:P: 4:0:0** **CA: 30**
**Credit: 4**

**Instructions for Paper Setter -**

Eight questions of equal marks (14 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

**UNIT I**

**Introduction:** Basic concepts of Computer Networks, Network topologies, Types of Networks (LAN, MAN, WAN).
**Models:** OSI Reference Model, TCP/IP Model, Comparison between TCP/IP and OSI model

**UNIT II**

**Transmission Media:** Coaxial Cable, Twisted Pair Cable, Fiber Optics & Satellites.

**Internetworking Devices:** Routers, Bridges, Repeaters, Gateways, Hub Switches, Routing Algorithms (Distance Vector, Link State).
**Introduction to Analog and Digital Transmission:** Introduction to Analog Signals, digital Signals, Modems, Types of modems, pulse code modulation.

**UNIT III**

Multiplexing and its types, Circuit Switching, Packet Switching, Message Switching.

**Data Link Layer Design Issues:** Error Control, Flow Control, Error Detection & Correction

## UNIT IV

**Network Addressing-** IP Address, IPv4: Notation, Classful addressing, Header Format, IPv6 addressing.

Data compression techniques- Lossy & Lossless, Introduction to Cryptography, types of Key.

**References/Textbooks:**


1. *Behrouz A. Forouzan, Data Communications & Networking, McGraw-Hill Education (2012), 5th ed.*
2. *Andrew S. Tanenbaum, Computer Network, Prentice Hall (2010), 5th ed.*
3. *Abraham Silberschatz, Greg Gagne, Peter B. Galvin, Operating System Concepts, Wiley Publishers (2018), 10th ed.*
4. *Charles Crowley, Operating Systems: A Design Oriented Approach, Tata McGraw Hill (2001), 1st ed.*
5. *Anshuman Sharma,Fundamentals of Operating System, Lakhanpal Publishers (2016), 2nd ed.*

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

# DATABASE MANAGEMENT SYSTEM
# COURSE CODE: PCAL–2113

**Course Outcomes:**

After the completion of this course, the student will be able to:

CO1: Comprehend database architecture, database models and normalization of data.

CO2: Apply SQL to formulate queries and design basic level of database.

CO3: Apply various built-in functions for formatting of data.

CO4: Comprehend the basics of Programming Language i.e. PL/SQL

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

**DATABASE MANAGEMENT SYSTEM**
**COURSE CODE: PCAL–2113**

**Examination Time: 3 hours** **Max. Marks: 100**
**Theory: 70**
**L:T:P: 4:0:0** **CA: 30**
**Credit: 4**

**Instructions for Paper Setter -**

Eight questions of equal marks (14 marks each) are to be set, two in each of the four sections (A-D). Questions of Sections A-D should be set from Units I-IV of the syllabus respectively. Questions may be divided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each section. The fifth question may be attempted from any section

**UNIT I**

**Basic Concepts:** An overview of Database Management, (database, database system, why database). An architecture for a database system (levels of the architecture, mapping, data independence), DBA, Definition of CODD's Rules

**Normalization of Data:** First, Second and Third Normal form

**Database Models:** Hierarchical, Network, Relational.

Introduction to Relational database systems

**UNIT II**

**ORACLE 10g:** Introduction to Oracle

**Data Types:** Char, numbers, date long, raw, long raw.

**DDL Commands of SQL:** Create Tables, Constraints, Alter Table, Drop Table, Rename.

**Data Manipulation Language:** Insert Into, Update Statement, Delete Statement, Select statement (Select distinct, Select from where, Select from where order by, Select group by clause, Select Group by having clause).

**Transaction Control Language:** Roll back, Savepoint, Commit.

## UNIT III

**Built in Functions-**Aggregate Functions (Sum, Avg, max, min, count),Character Functions (Lower, Upper, Length, Substr, RPAD,LPAD), Arithmetic Functions (Round, Trune, Sqrt, Mod, Abs, Sine) Date and Time Functions and Other Miscellaneous Functions(Add-months, Month-between, NVL, NVL2, decode)&Conversion Functions (to-char, to-number, to-date).

Join methods & Sub query, Union, Intersection, Minus, Views, Security amongst users.

## UNIT IV

**PL/SQL:** Introduction to PL/SQL, Relationship between SQL & PL/SQL, Advantages, block structure, Valuable and Constant declaration, Declaration using attributes %type attribute, control statements.

**References/Textbooks:**


1. *Silberschatz, Korth&Sudarshan, Database Systems Concepts, McGraw-Hill Inc.(2020), 7th ed.*
2. *C.J. Date, An Introduction of Database System, Addison-Wesley Publishing co.(2003), 8th ed.*
3. *Anshuman Sharma, Fundamentals of DBMS, Lakhanpal Publishers (2016), 4th ed.*
4. *Ivan Bayross, SQL/PL/SQL. The Programming Language of Oracle, BPB Publications(2010), 4th ed.*

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

**LAB ON PC COMPUTING-II**
**(PROFESSIONAL DTP)**

**COURSE CODE: PCAP–2114**

**Course Outcomes:**

After passing this course the student will be able to:

CO1: Apply different tools to edit image.

CO2: Comprehend to create different logos.

CO3: Apply different tools to create magazine covers, business cards and banners.

CO4: Apply different kind of transformation, grouping, special effects, etc.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

**LAB ON PC COMPUTING-II**
**(PROFESSIONAL DTP)**

**COURSE CODE: PCAP–2114**

**Examination Time: 3 hours** **Max. Marks: 50**
**Practical: 35**
**L:T:P: 0:0:2** **CA: 15**
**Credit: 2**

**GIMP:** Selection Tools-Rectangle, Ellipse, Free Select, Foreground Select, by Color Select, Fuzzy Select, Paint Tools-Brush Tools, Bucket Fill, Gradient, Gradient, Pencil, Paintbrush, Eraser, Clone, Heal, Blur/Sharpen, Smudge, Dodge/Burn, Transform Tools- Move, Crop, Rotate, Scale, perspective, Flip, Paths, Layers.

**GIMP:** Change the background of images, Image Manipulation, Transform & Distort Images, Create logos.

**Inkscape:** Object Creation- Drawing Tools, Shape Tools, Text Tools, Clones, Object Manipulation- Transformation, Grouping of objects, Layering of objects, Styling Objects- Fill, Stroke, Filters, Operations on paths, Text Support.

**Inkscape:** Business card, Magazine cover, Banner design, Create logos.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

**LAB ON DATABASE MANAGEMENT SYSTEM**
**COURSE CODE: PCAP–2115**

**Examination Time: 3 hours** **Max. Marks: 50**
**Practical: 35**
**L: T:P: 0:0:2** **CA: 15**
**Credit: 2**

Lab on Database Management System.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

**MINOR PROJECT**

**COURSE CODE: PCAD–2116**

**Course Outcomes:**

After passing this course the student will be able to:

CO1: Work within defined time and resource constraints.

CO2: Address the Real-World Problems and find the required solution.

CO3: Formulate and propose a plan for creating a solution.

CO4: Demonstrate an ability to work in teams and manage the conduct of study.

**POST GRADUATE DIPLOMA IN COMPUTER APPLICATIONS SEMESTER – II**

**Session 2024-25**

## MINOR PROJECT

## COURSE CODE: PCAD–2116

**L-T-P: 0-0-4** **Max. Marks: 100**

**Practical Marks: 70**

**Credits:4** **CA: 30**

**Examination Time: 3 Hours**

**General Instructions:**

1. A Minor Project based on the work done in the entire course is to be developed.
2. Candidates have to submit one hard copy and two CDs/DVDs of the Minor Project documentation which shall be kept with the HoD in the college only. Further, supervisor shall forward one copy of DVD/CD to the COE Office, with a covering letter containing Candidate name, Candidate Roll no and Assignment Title.