

the Post Graduate Board of Studies (PGBS)
held on 9th July 2026 in the Department of
ICT.

Examination Scheme and Syllabus

for

Post Graduate Diploma in Computer Application (PGDCA)

(For Weekend Programme in UTD only)

(Semester: I and II)

w.e.f. Session-2026-27

(Choice Based Credit System)



CHAUDHARY BANSI LAL UNIVERSITY

Prashant

BHIWANI



Chaudhary Bansi Lal University, Bhiwani

(Established under Govt of Haryana Act No 25 of 2014)

Study & Evaluation Scheme Of Post Graduate Diploma in Computer Application Summary

- Programme: Post Graduate Diploma in Computer Application
- Duration: One Years full time (Two Semesters)
- Medium: English
- Minimum Required Attendance: 75%
- Total Credits: 105

Assessment/ Evaluation

Internal Marks	External Marks	Total Marks
30	70	100

Internal Evaluation

Minor Test	Attendance	Assignment(s)
10	05	05

Duration of Examination

External	Minor Test (Internal)
3 hrs	1 ¹ / ₂ hr

To qualify the course, a student is required to secure a minimum of 40% marks in aggregate including the end semester examination and internal evaluation (i.e. both internal and external). A candidate who secures less than 40% of marks in a course shall be deemed to have failed in that course. The student should have at least 40% marks in aggregate to clear the semester.

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Note: Students should be involved in extracurricular activities through Hobbies Club (Non-CGPA) such as Poetry, Science, Club, Drama etc. and will be awarded a letter grade at the competition of M.Sc.

Question Paper Structure

1. *The paper shall consist of 9 questions. Out of which, first question shall be of short answer type and will be compulsory. Question No. 1 shall contain 8 parts representing all units of the syllabus and students shall have to answer all parts.*
2. *The remaining 8 questions shall have internal choice. The weightage for each question shall be 16 marks.*

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Program Outcomes for Post Graduate Program (CBCS) in the Faculty of Sciences

PO1	Knowledge	Capable of demonstrating comprehensive disciplinary knowledge gained during course of study
PO2	Communication	Ability to communicate effectively on general and scientific topics with the scientific community and with society at large
PO3	Problem Solving	Capability of applying knowledge to solve scientific and other problems
PO4	Individual and Team Work	Capable to learn and work effectively as an individual, and as a member or leader in diverse teams, in multidisciplinary settings.
PO5	Investigation of Problems	Ability of critical thinking, analytical reasoning and research based knowledge including design of experiments, analysis and interpretation of data to provide conclusions
PO6	Modern Tool usage	Ability to use and learn techniques, skills and modern tools for scientific practices
PO7	Science and Society	Ability to apply reasoning to assess the different issues related to society and the consequent responsibilities relevant to the professional scientific practices
PO8	Life-Long Learning	Aptitude to apply knowledge and skills that are necessary for participating in learning activities throughout the life
PO9	Environment and Sustainability	Ability to design and develop modern systems which are environmentally sensitive and to understand the importance of sustainable development.
PO10	Ethics	Apply ethical principles and professional responsibilities in scientific practices
PO11	Project Management	Ability to demonstrate knowledge and understanding of the scientific principles and apply these to manage projects

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Program Specific Outcomes for Post Graduate Program (CBCS) in the subject of Computer Science

After successful completion of the program, a student will be able to:

PSO1	Develop competency to administer knowledge and awareness in the computing discipline along with learning aptitude for lifelong endurance in professional realm.
PSO2	Develop proficiency to adapt to contemporary technologies, skills and models for computing practice.
PSO3	Acquire expertise to adopt skills realized during research, experimentation and trending technology cognizance to solve industrial problems.
PSO4	Promote professional competence to aspire careers in Commercial/ Government Sectors, Academics/ consultancy/ Research and Development for technological innovations, and collateral fields related to Computer Science and Information Technology.
PSO5	Foster analytical skills for programming and adept computer based designing of systems in the domains concordant to Algorithm Design, System Software, Web and Application Designing, Data Science & Analytics, Artificial Intelligence & Machine Intelligence, Graphics and Visualization, and Networking Services.

Outline of Type of courses

- **Core Course:** A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.
- **Skill Enhancement Courses (SEC):** courses are the courses based upon the content that leads to Knowledge enhancement. These courses are value-based and/or skill-based and are aimed at providing hands-on-training, competencies, skills. These courses may be chosen from a pool of courses designed to provide value-based and/or skill-based knowledge.

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Outline of Mode of Learning

- **Self-Learning (SL):** Self learning by students using prescribed open learning resource.
- **Guided Self Learning (GSL):** Guided Self learning-teachers to brief students about the open learning resources.
- **Blended Learning (BL):** Blended learning in the classroom-using traditional teaching combined with digital learning.
- **Classroom Learning (CL):** Only classroom, lab or field learning.

Self-Learning Courses (SL)

Guidelines:

Objective: These courses intend to create habits of reading books and to develop writing skills in a manner of creativity and originality. The students are to emphasis his/her own ideas/words which he/she has learnt from open learning resources, different books, journals and newspapers and deliberate the same by adopting different ways of communication techniques and adopting time scheduling techniques in their respective fields of research.

Aims:

- To motivate the students for innovative, research and analytical work
- To inculcate the habit of self-study and comprehension
- To infuse the sense of historical back ground of the problems
- To assess intensity of originality and creativity of the students

Instructions for Students

- Each student has to select a topic related to title of the course.
- Each student has to prepare a manuscript related to title of the course.
- Expected to be creative and original in approach.
- Submit handwritten manuscript of A4 size 8-10 pages.
- Organize manuscript in three broad steps:
 - Introduction
 - Main Body
 - Conclusions
- Use headings and sub-headings.
- Use graphics wherever necessary.
- Give a list of books/references cited/used.

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Scheme of Examination for PGDCA

Semester: 1st

Sr. No.	Course/ Paper Code	Title of the Course	Mode of Learning	Course Type	Credit			Contact Hours per Week			Examination Scheme			Total Marks
					Theory	Practical/Seminar	Total	Theory	Practical/Seminar	Total	Major Test (End Semester Exam)	Internal Assessment	Practical (External)	
1	26PGDCA 101	Introduction to Information Technology	CL/BL	CC	4	--	4	4	--	4	70	30	--	100
2	26PGDCA 102	Computer Programming Using C	CL/BL	CC	3	--	3	3	--	3	50	20	--	70
3	26PGDCA 103	Operating Systems	CL/BL	CC	4	--	4	4	--	4	70	30	--	100
4	26PGDCA 104	Computer Networking	CL/BL	CC	4	--	4	4	--	4	70	30	--	100
5	26PGDCA 102P	Lab based on 26PGDCA102	CL	SEC	--	1	1	--	2	2	20	10		30
		Total					16			17				400

CC - Core Course;

SEC-Skill Enhancement Course;

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Scheme of Examination for PGDCA

Semester: IInd

Sr. No.	Course/ Paper Code	Title of the Course	Mode of Learning	Course Type	Credit			Contact Hours per Week			Examination Scheme			Total Marks
					Theory	Practical/S eminar	Total	Theory	Practical/ Seminar	Total	Major Test (End Semester Exam)	Internal Assessment	Practi cal (Exter nal)	
1	26PGDCA 201	Software Engineering	CL/BL	CC	4	--	4	4	--	4	70	30	--	100
2	26PGDCA 202	Web Technologies	CL/BL	CC	3	--	3	3	--	3	50	20	--	70
3	26PGDCA 203	Database Management System	CL/BL	CC	4	--	4	4	--	4	70	30	--	100
4	26PGDCA 204	Emerging Trend in Computer	CL/BL	CC	4	--	4	4	--	4	70	30	--	100
5	26PGDCA 102P	Lab based on 26PGDCA202	CL	SEC	--	1	1	--	2	2	20	10		30
		Total					16			17				400

CC - Core Course;

SEC-Skill Enhancement Course;

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Maximum Marks: 100
External Examination: 70
Internal Assessment: 30
Max. Time: 3 Hrs

About the Course and its Objectives & Outcomes:

- To make student understand various components of computer and their working.
- Learn MS-Office and its components.
- To make student understand about Internet and Internet services. By the end of the course a student is expected to:
- Learn how computer works and the importance of various components of computers.
- Understand about how Internet works.
- Select particular configuration of computer necessary for the application.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of seven short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

UNIT I

Computer Fundamentals: Introduction to Computers: Characteristics and Limitations of Computers, Evolutions of Computers, Classification of Computers, Computer Languages, Types of software, Structured Programming Concepts. Basic Computer Organization: Units of a computer, CPU, ALU, Memory Hierarchy, Registers, I/O devices, Mother Board.

UNIT – II

Word Processing: Introduction to MS-Word, Creating & Editing Text: Paragraph Formatting, Page Formatting, Template, Page, Views, Table; Advanced Features: Bookmark, Mail Merge, Macros.

UNIT – III

Spread Sheets: Introduction to MS-Excel, Creating & Editing Worksheet, Formatting data, Formulas and Functions, Creating Charts, Pivot Tables. Power Point Presentations: Creating, Manipulating & Enhancing Slides, Organizational Charts, Animations & Sounds, Inserting Animated Pictures

UNIT – IV

Internet Basics: History of Internet, Web Browsers, Web Servers, Hypertext Transfer Protocol, Internet Protocols Addressing, Internet Connection Types, How Internet Works, ISPs, Search Engines, Emails and Its Working, Internet Security, Uses of Internet, Computer Networks and their advantages, Types of Computer Network, Network Topologies, Basics of Transmission Media; Cloud Computing Basics: Overview, Applications, Intranets and the Cloud; Benefits, Limitations and Security Concerns.

Suggested Readings:

Text and Reference Books:

- Satish Jain, Kratika, M. Geetha, "MS Office", BPB Publications, 2010.

- ITL Education Solutions Limited, "Introduction to Computer Science", Pearson Education, 2nd Edition 2012.
- P. K. Sinha, "Computer Fundamentals", 6th edition, 2003
- Tony Feldman, "Introduction to Digital Media", Routledge; 1 edition, 1996
- Bartee, Thomas C, "Digital Computer Fundamentals", McGraw-Hill Inc., 6th Edition, 1984

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Maximum Marks: 70
External Examination: 50
Internal Assessment: 20
Max. Time: 3 Hrs

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of TEN short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

About the Course and its Objectives & Outcomes:

The objectives of this course are to make students to understand programming language, concepts of structured programming, Control structures, Stepwise refinement, Functions, Arrays, and Pointers etc. The main emphasis of the course will be on problem solving aspect i.e. developing proper algorithms. By the end of the course a student is expected to:

- Use the various constructs of a programming language.
- Write program in „C“ language to solve a problem.
- Implement the algorithms in „C“ language.
- Handle Files in „C“

UNIT I

Programming process: Problem definition, Algorithm development, Flowchart, Program Coding, compilation, debugging, testing and execution, Types of errors. C Programming Fundamentals: Identifiers and keywords, Structure of C Program data types, input and output, type conversion.

UNIT – II

Operators & Expressions: Arithmetic, unary, logical and relational operators, assignment operator, Bit-wise, conditional operator, library functions. Control statements: Decision making using if, if-else, Nested IF, Else If Ladder switch, break, continue statement and goto Statement, looping using for, while and do-while statements, nested loops.

UNIT – III

Functions: Library functions, Defining & accessing User defined functions, function prototype and passing arguments to a function, recursion versus iteration. Macro v/s function.

Arrays: Definition, accessing elements, initialization, passing to functions, multi-dimensional arrays, Strings & operations of Strings, String Handling through Built-in and User Defined Functions.

Pointers declaration, assignment, Pointer Arithmetic, passing pointer to functions, pointer arrays, Dynamic Memory Allocation.

UNIT – IV

Structure and Union: Defining and Initializing Structure, accessing members, nested structures, pointer to structures, self-referential structures, Unions: Introduction to Unions and its Utilities. File Handling and

Storage classes: automatic, register, external and static variables; Opening and Closing file in C, Modes of File, Reading and Writing data to a file.

Suggested Readings:

- E.Balaguruswamy, "Programming in C", TMH.
- Y.Kanetkar, "Let Us C" BPB Publication.
- Byron Gottfried, "Programming with C", Schaum's outline series" TMH

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Maximum Marks: 100
External Examination: 70
Internal Assessment: 30
Max. Time: 3 Hrs

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of seven short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

About the Course and its Objectives & Outcomes:

The objective of this course is to help students become familiar with the fundamental concepts of operating systems and provide students with sufficient understanding of operating system design. By the end of the course a student is expected to:

- Exhibit familiarity with the fundamental concepts of operating systems.
- Exhibit competence in recognizing operating systems features and issues.

Unit I

Introduction: Introduction to Operating System Concepts, Various Operating System functions, Types of Operating Systems: Batch Operating System, Multi programming, Time-Sharing System, Real time, Multi processing, System architecture, System Calls,

Unit II

Process Management: Process Concept, Process Model, Hierarchies and Implementation, Process States and Transitions, Operations on a process, Level of Scheduler, CPU Scheduling, Scheduling Criteria, Scheduling Algorithms- First come First Serve (FCFS), Shortest- Job- First (SJF), Priority Scheduling, Round Robin (RR), Priority Scheduling

Unit III

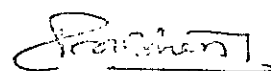
Memory Management: Logical & Physical Address Space, Swapping, Contiguous Memory allocation, paging and segmentation techniques; Virtual Memory Management- Demand Paging, Page replacement, Page Replacement Algorithm

Unit IV

Device Management: Disk structure, Disk scheduling: FCFS, SSTF, SCAN, C-SCAN, LOOK, C-LOOK.

File management: File system Structure, Allocation methods: Contiguous allocation, Linked allocation, Indexed allocation.

Deadlock: System model, Deadlock characterization, Methods for handling Deadlocks: Deadlock prevention, Deadlock avoidance.



Suggested Readings:

1. Operating System Concepts by Silberschatz et al 5th Edition 1998, Addison-Wesley.
2. Modern Operating System by A. Tanenbaum, 1992, Prentice Hall
3. Operating System By Peterson, 1985, AW.
4. Operating System By Milankovik, 1990, THM
5. Operating System Incorporating with Unix & Windows by Colin Ritchie, 1974, THM.

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Maximum Marks: 100
External Examination: 70
Internal Assessment: 30
Max. Time: 3 Hrs

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of seven short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

About the Course and its Objectives & Outcomes:

The objectives of this course are:

- To introduce to various types of Networks. Networks relates to the Communication among various Gadgets and Networking devices.
- To understand the OSI model for Networks that defines collection of protocols for the related communication.
- To learn various wired and wireless connections for communication.

By the end of the course a student is expected to:

- Able to understand the nature of computer network.
- Able to identify the type of Network in the work environment and identify the protocols at various layers.
- Define OSI reference models and its layers

Unit I

Introduction: Computer Communications and Networking Technologies; Uses of Computer Networks; Network Devices: Nodes, and Hosts; Types of Computer Networks and their Topologies; Network Software: Network Design issues and Protocols; Connection-Oriented and Connectionless Services; Computer Communications and Networking Models: Decentralized and Centralized Systems, Distributed Systems, Client/Server Model.

Unit II

OSI Reference Model: Physical, Data Link, Network, Transport, Session, Presentation and Application layer; Advantages and Disadvantages of OSI model; Example Networks: Internet, ATM.

Unit III

Network hardware components: Connectors, Transceivers, Network Interface Cards, Hubs, Switches, Repeater, Bridges, Routers, Gateways; Transmission media: Guided- Twisted, Coaxial, Fiber –optic cable, Unguided-Radio waves, Microwaves, Infrared Transmission, Wired versus Wireless Networks.

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Unit IV

Analog and Digital Communications Concepts: Representing Data as Analog Signals, Representing Data as Digital Signals, Data Rate and Bandwidth, Capacity, Baud Rate; Digital Carrier Systems; Communication Satellites; Switching and Multiplexing; Dialup Networking, Broadband Connection, Wireless Connection.

Suggested Readings:

- Andrew s. Tanenbaum, "Computer Networks", PHI.
- Fred Halsall, "Data Communications, Computer Networks and Open Systems", fourth edition, Addison Wesley.
- Behrouz, Forouzan, "Introduction to Data Communications and Networking", Tata Mc-Graw Hill.
- William Stallings, "Data and Computer Communications", fifth edition, PHI.

Forouzan

Computer Programming Using C (Based on 26PGDCA102)	0L:0T:2P	1 Credits
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Maximum Marks:30
External Examination: 20
Internal Assessment: 10

1. Write a program to print sum and average of two given numbers.
2. Write a program to swap two numbers without using a third variable.
3. Write a program check whether the given number is even or odd.
4. Write a program to print the largest number among three numbers given by the user.
5. Write a program to print table of any number using for loop.
6. Write a program to print Fibonacci Series (0, 1, 1, 2, 3, 5, 8, 13, 21...)
7. Write a program to print table of any number using do while loop
8. Write a program to print factorial of a given number using recursive function.
9. Write a program to print Fibonacci series using recursion.
10. Write a program to scan and print 5 values using array
11. Write a program to print the largest value in an array.
12. Write a program to print length of a given string without using string functions.
13. Write a program to check a string is palindrome or not.

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Semester: 2

21PGDCA201

Software Engineering

4L:0T:0P

4 Credits

Maximum Marks: 100
External Examination: 70
Internal Assessment: 30
Max. Time: 3 Hrs

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of seven short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

About the Course and its Objectives & Outcomes:

The objectives of this course are to:

- Introduce students to software development life cycle and models for developing and effective and efficient software
- Identify software requirements for manual or automated real-world systems
- Compare and contrast software process models and software development methodologies
- Moreover, student will learn the skill of software requirement specification and software quality assurance techniques

By the end of the course a student is expected to:

- Describe the software development life cycle as well as describing the various software development model and understand the advantages and disadvantages of each model;
- Illustrate the software requirement specification, Effort estimation
- Understand the use of model checking and be able to use it effectively.

Unit I

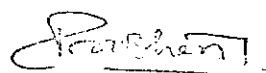
Introduction: Program vs. Software, Software Engineering paradigms, Software Crisis – problem and causes. Phases in Software development: Requirement, Analysis, Software Design, Coding, Testing, Maintenance. Software Development Process Models: Waterfall, Prototype, RAD and Spiral models.

Unit II

Software Requirement Analysis and Specifications: Feasibility Study, Software Requirements, Need for SRS, Characteristics of an SRS, Components of an SRS, Structure of a requirements document, Information Gathering tools, Data Flow Diagram, Data Dictionary, Decision table, Decision trees.

Unit III

Testing: Testing fundamentals, Error, Fault, and Failure, Test Oracle, Test Case and Test Criteria, Psychology of testing, Black Box Testing, Boundary value analysis, Equivalence Class Partitioning, Decision Table based testing, Cause effect graphing, White box testing, Control flow based criteria, level of testing, Unit testing, Integration testing, System testing, Validation testing, alpha, beta, and Acceptance testing.



Unit IV

Software Implementation and Maintenance: Type of maintenance, Management of Maintenance, Maintenance Process, maintenance characteristics. Quality assurance, Reengineering, Reverse engineering, Software configuration management

Suggested Readings:

- Jalote P., "An Integrated approach to Software Engineering", Narosa.
- Sommerville, "Software Engineering", Pearson Education.
- Fairley R., "Software Engineering Concepts", Tata McGraw Hill.

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Maximum Marks: 70
External Examination: 50
Internal Assessment: 20
Max. Time: 3 Hrs

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of ten short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

About the Course and its Objectives & Outcomes:

The objectives of this course are

- Learn HTML and design various web pages.
- Learn tags and its uses in web designing process with HTML.

By the end of the course a student is expected to be familiar with:

- Become skilled at Web Designing Complete Process.
- Make Web Pages using tags in HTML.
- Get proficient in using HTML.

Unit I

Information Files Creation; Web Server; Web Client/Browser

(Understanding how a Browser communicates with a Web Server); Hyper Text Markup Language (HTML) (HTML Tags, Paired Tags); Commonly used HTML Commands (The structure of an HTML program, Document Head, Document Body); Titles and Footers; Text Formatting (Paragraph Breaks, Line Breaks); Emphasizing Material in a Web Page (Heading Styles, Drawing Lines); Text Styles (Bold, Italics, Underline); Other Text Effects (Centering (Text, Images etc.); Spacing (Indenting Text).Lists: Types of Lists (Unordered List (Bullets), Ordered Lists (Numbering), Definition. Adding Graphics to HTML Documents: Using the Border attribute; using the Width and Height Attribute; Using the Align Attribute; Using the ALT Attribute.

Unit II

Tables : Introduction (Header, Data rows, The Caption Tag); Using the Width and Border Attribute; Using the Cell padding Attribute; Using the Cell spacing Attribute; Using the BGCOLOR Attribute; Using the COLSPAN and ROWSPAN Attributes. Linking Documents: Links (External Document References, Internal Document References); Images as Hyperlinks (Image Maps).Frames: Introduction to Frames (The <FRAMESET> tag, The <FRAME> tag, Targeting Named Frames.DHTML: Cascading style sheets, Style tag

Unit III

Introduction to JavaScript : JavaScript in Web Pages (Netscape and JavaScript, Database Connectivity, Client side JavaScript, Capturing User Input); The Advantages of JavaScript (An Interpreted Language, Embedded within HTML, Minimal Syntax - Easy to Learn, Quick Development, Designed for Simple, Small Programs, Performance, Procedural Capabilities, Designed for Programming User Events, Easy Debugging and Testing, Platform

Independence/Architecture Neutral); Writing JavaScript into HTML;

Unit IV

Forms Used by a Web Site: The Form Object; The Form Object's Methods (The Text Element, The Password Element, The Button Element, The Submit (Button) Element, The Reset (Button) Element, The Checkbox Element, The Radio Element, The Text Area Element, The Select and Option Element, The Multi Choice Select Lists Element); Other Built-In Objects in JavaScript (The String Object, The Math Object, The Date Object); User Defined Objects (Creating a User Defined Object, Instances, Objects within Objects). Cookies: What are Cookies; Setting a Cookie..

Suggested Readings:

- Raj Kamal, "Internet and Web Technologies", Tata McGraw-Hill.
- Ramesh Bangia, "Multimedia and Web Technology", Firewall Media.
- Thomas A. Powell, "Web Design: The Complete Reference", 3-edition, Tata McGraw-Hill.
- Wendy Willard, "HTML: A Beginners Guide", Tata McGraw-Hill.
- Deitel and Goldberg, "Internet and World Wide Web, How to Program", PHI.

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21PGDCA203

Database Management System

4L:0T:0P

4 Credits

Maximum Marks: 100
External Examination: 70
Internal Assessment: 30
Max. Time: 3 Hrs

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of seven short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

About the Course and its Objectives & Outcomes:

The objectives of this course are

- To provide comprehensive coverage of the problems involved in database design, in-depth coverage of data models and database languages, and a survey of implementation techniques applied in modern DBMS.
- To provide practical skills of conceptual/logical database design and general familiarity with the problems and issues of database management.
- To develop skills that is appropriate for Database Administrators, Database Application Developers, Database Specialists, and DBMS developers.

By the end of the course a student is expected to be familiar with:

- The basic concepts and appreciate the applications of database systems.
- The basics of SQL and construct queries using SQL.
- A relational database system theory and be able to design database based on relational data model.

Unit I

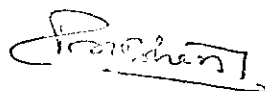
Overview: File Systems vs. DBMS, Characteristics of the Data Base Approach, Database users, Advantages and Disadvantages of a DBMS, Responsibility of Database Administrator.

Data Base Systems Concepts and Architecture: Data Models, Schemas and Instances, DBMS architecture and various views of Data, Data Independence, Database languages.

Unit II

Entity Relationship Model: Basic Concepts-Entity, Attributes, Types of Attributes, Entity set and Keys, Relationships-Relationship set, Degree of Relationship, Roles and Structural Constraints, E- R Diagrams, Reduction of an E-R Diagram to Tables, Binary Representation and Cardinality, Participation Constraints

Unit III



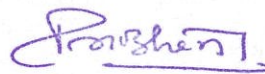
Relational Data Model:-Brief History, Relational Model Terminology-Relational Data Structure, Database Relations, Properties of Relations, Keys, Domains, Integrity Constraints over Relations, Base Tables and Views.

Unit IV

SQL: Introduction to SQL, Data Types in SQL, Common Commands in SQL- Select, Insert, Update and Delete, views in SQL; Relational Database Design: Functional Dependencies, Decomposition, Desirable properties of decomposition, Normal Forms (1 NF, 2 NF, 3 NF and BCNF).

Suggested Readings:

- Elmasri&Navathe, "Fundamentals of Database Systems", 3rd Edition, Addison Wesley, New Delhi.
- R.Pannerselvam, "Database Management Systems", 2nd Edition, PHI Learning Pvt. Ltd., New Delhi, 2011
- Bipin C. Desai, "An Introduction to Database System", Galgotia Publication, New Delhi
- Korth and Silberschatz, "Database System Concept", 4th Edition, McGraw Hill International Edition



21PGDCA204

Emerging Trend in Computer

4L:0T:0P

4 Credits

Maximum Marks: 100
External Examination: 70
Internal Assessment: 30
Max. Time: 3 Hrs

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of seven short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

About the Course and its Objectives & Outcomes:

The objectives of this course are

- Introduce the mathematical and logical structures behind Artificial Intelligence
- Provide a deep technical understanding of how digital media is safely captured and manipulated
- Teach the cryptographic primitives and consensus algorithms that allow global, multi-party systems to transact securely without relying on a centralized intermediary or central bank.
- Contextualize how enterprise-grade applications scale dynamically using modern virtualized frameworks, resource pooling, and cloud architecture.

By the end of the course a student is expected to be familiar with:

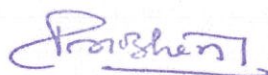
- Student can evaluate a real-world problem and determine whether to build a rigid Boolean rule engine or a flexible Fuzzy Logic machine.
- Student will understand the secret sauce behind Crypto and Blockchain.
- Student will evolve from a basic coder into a tech architect, be able to build a smart AI tool, make it secure and unhackable, and deploy it on global cloud servers.

Unit-I

Artificial Intelligence- Introduction to AI, Knowledge base system, Properties of AI, Software of AI, Organization working for AI, Fuzzy logic base machines, Work of cell and their classification. Data Encryption- Coding and Decoding techniques, First stage and second stage decoding, standard for data encryption. Image Processing-Introduction, Digital Image Processing, Various Phases of Image Processing.

Unit-II

Introduction, what is Machine Learning, Unsupervised Learning, Reinforcement Learning Machine Learning Use-Cases, Machine Learning Process Flow, Machine Learning Categories, Linear regression and Gradient descent



Unit-III

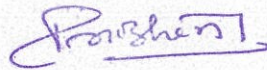
What is a Block chain? Basic ideas behind Block chain, how it is changing the landscape of digitalization, Uses of Block chain. Abstract Models for BLOCKCHAIN GARAY model - RLA Model, what is Multichain? Objective of Multichain, Features of Multichain, Uses of Multichain, Process of mining in Multichain technology, Analyse Multichain platform, why it is better than other open platforms Block chain Architecture and Design: Basic crypto primitives: Hash, Signature) Hash chain to Block chain.

Unit-IV

Evolution of Cloud Computing, Cloud Computing Overview, Characteristics, Applications, Benefits, Challenges. Suggested Readings:

Suggested Readings:

1. *Artificial Intelligence: A Modern Approach* (4th Edition) by Stuart Russell and Peter Norvig
2. *Cryptography and Network Security: Principles and Practice* by Rafael C. Gonzalez and Richard E. Woods
3. *Introduction to Machine Learning* (4th Edition) by Ethem Alpaydin
4. *Mastering Blockchain: Deeper insights into decentralization, cryptography, Bitcoin, and popular Blockchain frameworks* by Imran Bashir
5. *Cloud Computing: Principles and Paradigms* by Rajkumar Buyya, James Broberg, and Andrzej M. Goscinski



Web Technologies LAB (Based on 26PGDCA202)	0L:0T:2P	1 Credits
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Maximum Marks:30
External Examination: 20
Internal Assessment: 10

1. Write a HTML code that displays various formatting tags.
2. Write a HTML code to create ordered list.
3. Write a HTML code to create unordered list.
4. Write a HTML code to create table having 5 rows and 5 columns.
5. Write a HTML code to create admission form.
6. Write a HTML code to create a frame.
7. Write a HTML code to create image map.
8. Write a HTML code to create hyperlink b/w multiple pages.
9. Write a HTML code to create hyperlink to an image.
10. WRITE A PROGRAM in JavaScript to show a number is big or not.
11. Write A Program in JavaScript to implement for loop.
12. Write A Program in JavaScript to implement while loop.
13. Write A Program in JavaScript to show the usage of if statement.
14. Write A Program in JavaScript to show the usage of if-else statement.
15. Write A Program in JavaScript to show the usage of switch statement.
16. Write A Program in JavaScript to call a function.
17. Write A Program in JavaScript to show function with an arguments.
18. Write A Program in JavaScript to show number is even or odd.
19. Write A Program in JavaScript to show number is prime or not.

Prashant

