## SEMESTER-5th

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| **Course No: UBCATDSE-501** | **Course: Computer Networks and Internet** |
| **Total Marks: 100** | **Internal Assessment: 20**  **Semester Exam: 80** |
| **Duration of Examination:1 Hr.** | **Credits: 04(Theory)** |

**Learning Outcomes:**

1. Understand the structure of Data Communications System and its components. Be familiarize with different network terminologies.
2. Familiarize with contemporary issues in network technologies.
3. Know the layered model approach explained in OSI and TCP/IP network models
4. Identify different types of network devices and their functions within a network.
5. Learn basic routing mechanisms, IP addressing scheme and internetworking concepts.
6. Familiarize with IP and TCP Internet protocols.
7. To understand major concepts involved in design of WAN, LAN and wireless networks.
8. Learn basics of network configuration and maintenance.
9. Know the fundamentals of network security issues.

### Unit-I

Computer Networks: Concept of Network, Types of Network: LAN, WAN, MAN, Network Topologies Applications of Computer Network. Concept of Internet, Intranet and Extranet, Web server, WWW, Search Engines, Internet Service Providers

10 HRS

### Unit - II

Data and Signals: Analog &Digital Data, Analog &Digital Signals, Composite Signals, Band Width, Bit rate, Baud rate, Transmission of Digital Signals: Baseband Transmission, Broadband, Transmission Impairment, Data rate Limits: Nyquist BitRate, Shannon Capacity, Performance of the Network: Bandwidth" Throughput, Latency, Bandwidth Delay, Jitter, Transmission Modes (simplex half duplex and full duplex)

10 HRS

### Unit - III

Digital Transmission: Digital to Digital Transmission: Line Coding Schemes, Block Coding, Srambling, Analog to Digital Transmission: PCM, Delta Modulation, Data Transmission Modes: Parallel, Serial, Analog Transmission: Digital to Analog: ASK, FSK, PSK, QAM, Analog to Analog Conversion: Amplitude Modulation, Frequency Modulation &Phase Modulation, Asynchronous and Synchronous Communication, Multiplexing: Definiti n, TDM, FDM Transmission media (guided and unguided), Hardware Components (Hub, Repeater, Bridge, Router and Gateway).

10 HRS

### Unit - IV

OSI Reference model, *TCP/JP* Model, Protocols: *TCP/IT,* HTTPS, FTP, ARP, RARP, BOOTP, DHCP, OSPF, UDP, SMTP, SCTP, IP addresses, Classes ofIP addresses, Domain Name system, IPv4, Introduction to IPv6

10 HRS

### Unit-V

Introduction to html, format of HTML Program, Formatting tags, Image tags, linking of documents, List Tags, Tables Tags, Frames, Forms, Basic Concept of Style Sheets, CSS, Linking and Embedding of CSS in HTML document, Properties of CSS, inline style Sheets, Dynamic Style Sheets.

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Suggested Readings:

1. Computer Networks- Andrew.S. Tannenbaum
2. Data and Computer Communication- Williams Stallings
3. Data Communication and Networking- Forouzan
4. The Internet- Doulas and E. Comer
5. Beginning Web Programming with HTML, CSS and JavaScript- John Ducett

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## SEMESTER-5th

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| **Course No: UBCATDSE-502** | **Course: Artificial Intelligence** |
| **Total Marks: 100** | **Internal Assessment:20**   **Semester Exam:80** |
| **Duration of Examination: 1 Hr.** | **Credits:04(Theory+Practical)** |

**Learning Outcomes(LO):**

1. Explain what constitutes "Artificial" Intelligence and how to identify systems with Artificial Intelligence.
2. Identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem.
3. Formalise a given problem in the language/framework of different AI methods (e.g., as a search problem, as a constraint satisfaction problem, as a planning problem, etc).
4. Implement basic AI algorithms (e.g., standard search or constraint propagation algorithms).
5. Design and perform an empirical evaluation of different algorithms on a problem formalisation, and state the conclusions that the evaluation supports.
6. Explain the limitations of current Artificial Intelligence techniques.

**Unit-I**

Introduction to AI: AI Domains: games, theorem proving, Natural Language Processing, vision and speech processing, robotics, expert systems, AI techniques- search knowledge, abstraction. Problem solving: State space search; Production system, search space control: depth-first, breadth-first search, heuristic search – Hill climbing, best-first search, A* search, AO search, branch and bound.

10 Hours

**Unit-II**

Knowledge Representation: Predicate Logic: Unification, modus ponen, resolution, dependency directed backtracking. Rule based Systems: Forward reasoning: conflict resolution, backward reasoning: use of· no backtracks. Structured Knowledge Representation: Semantic Nets: slots, exceptions and default frames, conceptual dependency, scripts.

10 Hours

**Unit-III**

Unicertainity: Non-monotonic reasoning, Logics Implementation, Probability and Bayes theorem-Certainty factors, Bayesian networks, Dempster- Shafer theory

10 Hours

**Unit-IV**

Natural Language Processing: Definition, Phases Syntactic Processing, Semantic Analysis, Discourse and Pragmatic Processing. APPLICATIONs of Natural Language Processing

10 Hours

**Unit-V**

Expert Systems: Features, Characteristics-Architecture-Basic Activities-Stages in development, Structure of a knowledge base, Probability based Expert Systems – Tools, Need and justification for expert systems, knowledge acquisition,

<div align="right">10 Hours</div>

**Suggested Readings:**
1. E.Rich and K. Knight, "Artificial intelligence", TMH, 2nd Ed., 1992
2. N.J. Nilsson, "Principles of AI", Narosa Publ. House. 1990.
3. D.W. Patterson, "Introduction to AI and Expert Systems", PHI, 1992.
4. Peter Jackson, "Introduction to Expert Systems", AWP, M.A., 1992.
5. R.J. Schalkoff, "Artificial Intelligence – an Engineering Aproach", McGraw Hill Int. Ed., Singapore, 1992.
6. M. Sasikumar, S. Ramani, "Rule Based Expert Systems", Narosa publishing House, 1994.

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**SEMESTER-5th**

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| **Course No: UBCATDSE-503** | **Course: Advanced DBMS** |
| **Total Marks: 100** | **Internal Assessment:20**     **Semester Exam:80** |
| **Duration of Examination: 1 Hr.** | **Credits:04(Theory+Practical)** |

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**UNIT-I**

**The Relational Model of Data and RDBMS Implementation Techniques** Theoretical concepts, Relational model conformity and Integrity, Advanced SQL programming, Query optimization, Concurrency control and Transaction management, Database performance tuning, Distributed relational systems and Data Replication, Security considerations

<div align="right">10 Hours</div>

**UNIT-II**

**The Extended Entity Relationship Model and Object Model:** The ER model revisited, Motivation for complex' data types, User defined abstract data types and structured types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and characteristics of specialization and Generalization, Relationship types of degree higher than two.

<div align="right">10 Hours</div>

**UNIT III**

Form of Basic SQL Query: Examples of Basic SQL Queries, Introduction to Nested Queries. Correlated Nested Queries Set, Comparison Operators, Aggregative Operators, NULL values. Comparison using Null values, Logical connectivity's, AND, OR and NOT Impact on SQL Constructs, Outer Joins, Disallowing NULL values

<div align="right">10 Hours</div>

**UNIT IV**

Schema refinement : Problems Caused by redundancy , Decompositions , Problem related to decomposition BCNF, Lossless join Decomposition, Dependency preserving Decomposition, Schema refinement in Data base Design, Multi valued Dependencies, FORTH Normal Form.

<div align="right">10 Hours</div>

**UNIT V**

Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent, Executions, Serializability, Recoverability , Implementation of Isolation , Testing for serializability, Lock ,Based Protocols, Timestamp Based Protocols, Recovery and Atomicity: Log Based Recovery Recovery with Concurrent Transactions

<div align="right">10 Hours</div>

**Suggested Readings:**
1.Elmarsi, Navathe, Somayajulu, Gupta, "Fundamentals of Database Systems", 4 th Edition, Pearson Education,2007

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2. Garcia, Ullman, Widom, "Database Systems, The complete book", Pearson Education, 2007
3. R. Ramakrishnan, "Database Management Systems", McGraw Hill International Editions, 1998
4. D.ate, Kannan, Swaminathan, "An Introduction to Database Systems", 8th Edition Pearson Education, 2007
5. Smgh S.K., "Database System Concepts, design and application", Pearson Education, 2006.
6. Silberscatz, Korth, Sudarshan, "Database System Concepts", Mcgraw Hill, 6th Edition, 2006

| SEMESTER-5th | | |
|---|---|---|
| **Course No: UBCATS-502** | | **Course: Web-Technology** |
| **Total Marks: 100** | **Internal Assessment:20** | **Semester Exam:80** |
| **Duration of Examination: 1 Hr.** | | **Credits:04(Theory+Practical)** |

Learning Outcomes:

1. To understand basics of the Internet and World Wide Web
2. To acquire knowledge and skills for creation of web site considering both clientand server-side programming
3. To learn basic skill to develop responsive web applications
4. To understand different web extensions and web services standards
5. To understand basic concepts of Search Engine Basics.
6. To learn Web Service Essentials.
7. To learn Rich Internet Application Technologies.
8. To understand and get acquainted with Web Analytics 2.0

## UNIT-I

Introduction to Internet: Introduction, Objectives, Evolution, Applications (Email, Social Networking, E-Commerce etc.), World Wide Web (WWW), Search Engine, ISP. Basic of Computer Networks: (LAN, MAN, WAN), Network Topologies, Intranet, Extranet.

15 Hrs

## UNIT -11

Internet Terms: Web page, website, web portal, browsers, Web server, Proxy Server, URL, ISP, download and upload, online and offline, Hosting and Domain Name, Hypertext, TCP/IP, UDP, HTTP, HTTPS, FTP, IP Address and its classes.

15 Hrs

Practical:
1. Introduction to HTML,
2. Format of HTML Program,
3. Implementation of Formatting Tags
4. Use of Image Tags,
5. Linking of Documents, List Tag, Tables Tag, Frames, Forms.

**Suggested Reading:**

1. HTML 5 and CSS 3 Made Simple by Ivan Bayros.
2. Computer Networks- Andrew.S. Tannenbaum, Pearson.
3. CSS: The Definitive Guide, 3rd Edition by Eric Meyer, O'Reilly Media.
4. The Internet- Douglas E. Comer, Pearson.
5. Web Programming - Chris bates - Wiley Dreamtech India
6. Internet and Worldwide Web, H.M. Deitel, P.J. Dietel and AB. Goldberg, 3e, Pearson Education
7. Mastering Javascript and Jscript, James Jaworski, 2e, BPB
8. HTML, DHTML, JavaScript, Perl CGI by Ivan Bayross, BPB Publications

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| SEMESTER-5th | |
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| Course No: UBCATS-502 | Course: Information Security |
| Total Marks: 100 | Internal Assessment:20     Semester Exam:80 |
| Duration of Examination: 1 Hr. | Credits:04(Theory+Practical) |
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Learning Outcomes:

1.  Develop an understanding of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.
2.  Gain familiarity with prevalent network and distributed system attacks, defenses against them, and forensics to investigate the aftermath.
3.  Develop a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.
4.  Develop an understanding of security policies (such as authentication, integrity and confidentiality), as well as protocols to implement such policies in the form of message exchanges.

## UNIT I

Information Security Concepts, security, computer threats and computer vulnerabilities, Types of Attacks Overview of wired and Wireless Networks, internetworking, Internet, extranet, Malicious softwares- virus, Trojans, worms, Password Cracking, Threats using Programming Bugs, Introduction to Cybercrimes and Cyber terrorism.

10HRS

## UNIT - 11

Cryptography: Introduction to Cryptography, Symmetric key Cryptography, Asymmetric key Cryptography, Message Authentication and Hash functions, Digital Signatures, Public Key infrastructure, Security management, Firewalls, Antivirus software, email security

10HRS

**Practical:**
1. General features of Linux operating system.
2. Open data recovery software
3. Antivirus software
4. Concepts of Free and Open source software

Suggested Readings:

1.  Malcolm Harkins, Managing Risk and Information Security: Protect to Enable, Apress.
2.  Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003
3.  Micki Krause, Harold F. Tipton, "Handbook of Information Security Management",Vol \-3 CRC Press LLC, 2004.
4.  Matt Bishop, " Computer Security Art and Science", Pearson/PHI, 2002.
5.  Bruce Schneier, Applied Cryptography Second Edition, John Wiley &Sons, Inc.
6.  SunitBelapure, Nina Godbole, Cyber Security, Wiley.

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### SEMESTER-6th

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| **Course No: UBCATDSE-601** | **Course: PHP** |
| **Total Marks: 100** | **Internal Assessment:20**     **Semester Exam:80** |
| **Duration of Examination: 1 Hr.** | **Credits:04(Theory+Practical)** |

**Learning Outcomes:**
1. To learn the programming skills in PHP.
2. To learn the implementation of algorithms in PHP

#### UNIT I

Introduction to PHP: Evaluation of Php, Basic Syntax, Defining variable and constant, Php Data type, Operator and Expression, Embedding PHP script. Decisions and Control Structure: Making Decisions: Tf, Else if, switch statement, logical operators and while, for, foreachl), looping with HTML                                     10 HRS

#### UNIT                                                                                          11

**Function**: Creating function, Call by value and Call by reference, Recursive function, returning values,
scope and global variables.
**String:** Creating and accessing, String Searching &Replacing String, Formatting String, String Related
Library function
**Array**: Anatomy of an Array, Creating index based and Associative array Accessing array, Some useful Library function.                                     10 HRS

#### UNIT III

Handling Html Form with Php: Capturing Form, Data Dealing with Multi-value filed, and Generating File up loaded form, Redirecting a form after submission, Handling Submission, Validating form data, Custom validation function.
Session and Cookie: Introduction to Session Control, Session Functionality, Setting Cookies with PHP. Using Cookies with Sessions, Deleting Cookies, Registering Session variables, Destroying the variables and Session.
   10 HRS

#### UNIT IV

Database Connectivity with MySQL: Introduction to RDBMS, Connection with MySQL Database, Setting query parameter. Using PHP to Access MySQL: Database APls in PHP, Retrieving data from MySQL, Working with retrieved data, Creating records with PHP, Updating and deleting records with PHP, Validating Results, Ensuring Security, SQL injection, Escaping strings for MySQL.  10 HRS

#### UNIT V

Working with file and Directories: Understanding file&directory, Opening and closing, a file, Copying, renaming and deleting a file, working with directories, Creating and deleting folder, File Uploading & Downloading.
10 HRS

**Suggested Readings:**

1.Complete reference to PHP by Steven Holmer.
2.PHP and SQL by Simon Stobart and Mike Vassilelou

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## SEMESTER-6th

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| **Course No: UBCATDSE-602** | **Course: Android Programming** |
| **Total Marks: 100** | **Internal Assessment:20**  **Semester Exam:80** |
| **Duration of Examination: 1 Hr.** | **Credits:04(Theory+Practical)** |

**Learning Outcomes:**
1. To learn the programming skills in Android.
2. To learn the implementation of algorithms in Android.

**UNIT - I (Fundamentals of Java for Android Application Development)**

Introduction to Java, Java Dalvik Virtual Machine, Java Tokens, Primitive Data Type and Variables, Java Operators, Expressions, Selection Statements, Iteration Statements. Declaring Classes, Creating Objects, Methods, Interfaces, Inheritance

**UNIT - 11 (Getting an overview of Android)**

Introducing Android: Version history of Android platform, Android APIs, Android Architecture and Application . Framework. The Manifest file. Downloading and Installing Android SDK, Exploring the Development Environment, Developing and Executing Android Application using Eclipse IDE.

**UNIT - III (Using Activities, Fragments and Indents in Android)**

Activities: Creating and Starting an Activity, Managing the life cycle of an Activity, Displaying Applying Styles and Themes to an Activity, Hiding the Activity Title, Displaying a Dialog Window. Indents: Understanding the Intent Object, Linking Activities Using Intents, Resolving Intent Filter Collision, Returning Results from Intent, Passing Data Using an Intent Object. Fragments: Fragment implementation, Finding Fragments, Adding, Removing and Replacing Fragments, Calling Built-In Applications Using Intents,

**UNIT - IV(Working with the User Interface using Views and ViewGroups)**

Understanding the Components of a Screen: Views and ViewGroups, LinearLayout, TableLayout:, RelativeLayout, FrameLayout, ScrollView Layout. Using Basic Views: TextView, Button, ImageButton, EditText, CheckBox, ToggleButton, RadioButton, and RadioGroup, ProgressBar AutoCompleteTextView.
Adapting to Display Orientation: Anchoring Views" Resizing and Repositioning Creating Menus: Options Menu, Context Menu, Sub Menu.

**UNIT - V (Handling Pictures and Hardware Sensors)**

Working with Image Views: Displaying Images in the Gallery VIew, Displaying Images in Grid View, Using the Image Switcher View. Using AnalogClock and DigitafClock Views. Hardware Sensors: Introducing Sensors, Exploring the Sensor Framework, Understanding Sensor Coordinate System, Using Sensors.

Suggested Readings:

1. Pradeep.Kothari - "Android Application Development: Black Book", Dreamtech Press.
2. Wei-Meng Lee - "Beginning Android 4 Application Development ", John Wiley &Sons, Inc.