



# **KONGU ARTS AND SCIENCE COLLEGE**

**(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)**

**ERODE – 638 107**

**M.Sc (Computer Science)**



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**2020-2021**



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# **SYLLABUS**

| Sem. | Course Code | CORE PAPER – I                  |        | Hours Per Week | Credits |
|------|-------------|---------------------------------|--------|----------------|---------|
|      |             | ANALYSIS & DESIGN OF ALGORITHMS |        |                |         |
| I    | 20PBICT101  | CIA:25                          | ESE:75 | 5              | 4       |

Objective(s): On successful completion of the course the students should have:

- Understood the various design and analysis of the algorithms.

Course Outcomes:

At the end of the course, students will be able to

- CO1 Apply the elementary data structure in applications
- CO2 Understand the algorithms of basic traversal and search techniques
- CO3 Ability to solve problems using algorithm design techniques
- CO4 Understand algorithm design methods such as the greedy method and dynamic programming
- CO5 Apply the Concept of backtracking, branch and bound method to solve the real world problems.

#### UNIT- I

Introduction: - Algorithm Definition and Specification – Space complexity-Time Complexity- Asymptotic Notations - Elementary Data Structure: Stacks and Queues – Binary Tree - Binary Search Tree - Heap - Heapsort- Graph.

#### UNIT- II

Basic Traversal And Search Techniques: Techniques for Binary Trees-Techniques for Graphs -Divide and Conquer: - General Method – Binary Search – Merge Sort – Quick Sort.

#### UNIT- III

The Greedy Method: - General Method – Knapsack Problem – Minimum Cost Spanning Tree – Single Source Shortest Path.

#### UNIT- IV

Dynamic Programming - General Method – Multistage Graphs – All Pair Shortest Path – Optimal Binary Search Trees – 0/1 Knapsacks – Traveling Salesman Problem – Flow Shop Scheduling.

#### UNIT- V

Backtracking: - General Method – 8-Queens Problem – Sum of Subsets – Graph Coloring – Hamiltonian Cycles – Branch And Bound: - The Method – Traveling Salesperson.

#### REFERENCE BOOKS :

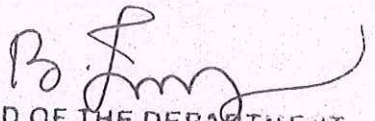
1. Ellis Horowitz, "Computer Algorithms", Galgotia Publications.
2. Alfred V.Aho, John E.Hopcroft, Jeffrey D.Ullman, "Data Structures and Algorithms".
3. Goodrich, "Data Structures & Algorithms in Java", Wiley 3rd edition.
4. Skiena, "The Algorithm Design Manual", Second Edition, Springer, 2008
5. Anany Levith, "Introduction to the Design and Analysis of algorithm", Pearson Education Asia, 2003.
6. Robert sedgewick, Phillipe Flajolet, "An Introduction to the Analysis of Algorithms", Addison Wesley Publishing Company, 1996.




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| QUESTION PAPER PATTERN  |   |   |
|---|---|---|
| SECTION - A   | SECTION - B   | SECTION - C   |
| <b>10 × 1 = 10 Marks</b><br>(Multiple Choice, Four options)<br>Two questions from each unit | <b>5 × 7 = 35 Marks</b><br>(Either or choice)<br>Two questions from each unit | <b>3 × 10 = 30 Marks</b><br>(Answer any three Questions)<br>One question from each unit |

  
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| Sem. | Course Code | CORE PAPER –II<br>OBJECT ORIENTED ANALYSIS<br>AND DESIGN & C++ | Total Marks: 100 |        | Hours<br>Per<br>Week | Credits |
|------|-------------|--|------------------|--------|----------------------|---------|
|      |             |  | CIA:25           | ESE:75 |                      |         |
| I    | 20PBICT102  |  |                  |        | 5                    | 4       |

Objective(s): On successful completion of the course the students should have:

- Understood the concepts in object models and C++ language

Course Outcomes:

At the end of the course, students will be able to

- CO1 Understand OOAD concepts.
- CO2 Understand the relationship among classes
- CO3 Explain the Input and Output operations and functions of C++
- CO4 Implement the concept of Constructors and Destructors
- CO5 Apply virtual function in complex programming situations

#### UNIT- I

The Object Model: The Evolution of the Object Model – Elements of the Object Model – Applying the Object Model. Classes and Objects: The Nature of an Object – Relationship among Objects.

#### UNIT- II

Classes and Object: Nature of Class – Relationship Among classes – The Interplay of classes and Objects. Classification: The importance of Proper Classification –identifying classes and objects –Key Abstractions and Mechanism.

#### UNIT- III

Introduction to C++ - Input and output statements in C++ - Declarations -control structures – Functions in C++.

#### UNIT- IV

Classes and Objects –Constructors and Destructors –operators overloading –Type Conversion- Inheritance – Pointers and Arrays.

#### UNIT- V

Memory Management Operators- Polymorphism – Virtual functions – Files – Exception Handling – String Handling -Templates.

#### REFERENCE BOOKS

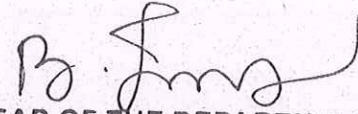
1. “Object Oriented Analysis and Design with Applications”, Grady Booch, Second Edition, Pearson Education.
2. “Object -Oriented Programming with ANSI & Turbo C++”, Ashok N.Kamthane, First Indian Print -2003, Pearson Education.
3. Balagurusamy “Object Oriented Programming with C++”, TMH, Second Edition, 2003.



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|--|---|---|
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| Sem. | Course Code | CORE PAPER – III<br><br>ADVANCED NETWORKS | Total Marks: 100 |        | Hours Per Week | Credits |
|------|-------------|---|------------------|--------|----------------|---------|
|      |             |   | CIA:25           | ESE:75 | 5              | 4       |
| I    | 20PBICT103  |   |                  |        |                |         |

Objective(s): On successful completion of the course the students should have:

- Gained in-depth knowledge of Internet protocols and their functionalities.

Course Outcomes:

At the end of the course, students will be able to

- CO1 Understand the TCP/IP suite of protocols and the networked applications supported by it.
- CO2 Map Internet address to physical address
- CO3 Work with the network layer of the OSI model
- CO4 Describe how TCP and UDP function
- CO5 Acquire knowledge of Application layer

#### UNIT- I

Introduction to digital networks - WAN - WAN standards - Introduction TCP/IP and Internet - network technologies - TCP/IP features, protocol standards Internetworking concepts and Architectural model - Network interface layer.

#### UNIT- II

IP layer: Internet Address - Mapping Internet Address to Physical Address - Determining an Internet address at startup - Transparent gateways and subnet addressing - multicast addressing - client-server model of interaction - bootstrap protocol - domain name system - address discovery and binding.

#### UNIT- III

Internet Protocol: Connectionless Datagram delivery - data Structures and input processing. Routing IP datagrams - error and control messages - protocol layering - user datagram protocol - reliable stream transport service - fragmentation and reassembly. Routing: Cores - peers and algorithms - autonomous systems – interior gateways protocols - routing table and routing algorithms

#### UNIT- IV

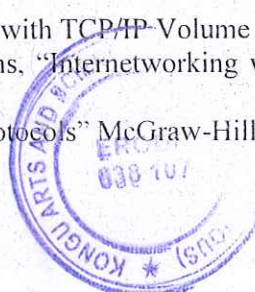
UDP: User datagrams. TCP: Data structures and Input processing - finite state machine implementation - output processing – timer management - flow control and adaptive retransmission - urgent data processing and the push function - socket level interfaces

#### UNIT- V

Application layer: Remote login - File transfer Access - electronic mails - Internet management. X.25 networks and support protocols.

#### REFERENCE BOOKS

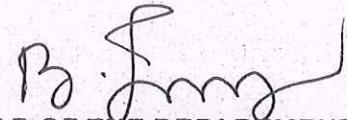
1. Douglas E. Comer, "Internetworking with TCP/IP-Volume I", Prentice Hall, 1991.
2. Douglas E. Comer, David L. Stevens, "Internetworking with TCP/IP Volume II", Prentice Hall, 1991
3. Uyles Black, "TCP/IP & Related Protocols" McGraw-Hill, 1995.



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| Sem. | Course Code | CORE PAPER – IV<br>ADVANCED<br>SOFTWARE<br>ENGINEERING | Total Marks: 100 |        | Hours<br>Per<br>Week | Credits |
|------|-------------|--|------------------|--------|----------------------|---------|
|      |             |  | CIA:25           | ESE:75 | 5                    |         |
| I    | 20PBICT104  |  |                  |        | 5                    | 4       |

Objective(s): On successful completion of the course the students should have:

- Understood the concepts of Software Engineering
- Understood the concepts of Software Project Management

Course Outcomes:

At the end of the course, students will be able to

- CO1 Understand the challenges in Software Development process.
- CO2 Explain about the Software Requirement Analysis and Specification
- CO3 Do the Project planning, tracking, Risk analysis, Quality management and Project Cost estimation using different techniques.
- CO4 Solve the issues and challenges faced in Software Design Process
- CO5 Understand and anticipate the possible causes of Software failure and knowledge of how to prevent them

#### UNIT- I

Introduction: The Problem Domain – Software Engineering Challenges - Software Engineering Approach – Software Processes: Software Process – Characteristics of a Software Process – Software Development Process Models – Other software processes.

#### UNIT- II

Software Requirements Analysis and Specification : Requirement engineering – Type of Requirements – Feasibility Studies – Requirements Elicitation – Requirement Analysis – Requirement Documentation – Requirement Validation – Requirement Management – SRS - Formal System Specification – Axiomatic Specification – Algebraic Specification - Case study: Student Result management system. Software Quality Management – Software Quality, Software Quality Management System, ISO 9000, SEI CMM.


#### UNIT- III

Software Project Management: Responsibilities of a software project manager – Project planning – Metrics for Project size estimation – Project Estimation Techniques – Empirical Estimation Techniques – COCOMO – Halstead's software science – Staffing level estimation – Scheduling – Organization and Team Structures – Staffing – Risk management – Software Configuration Management – Miscellaneous Plan.

#### UNIT- IV

Software Design: Outcome of a Design process – Characteristics of a good software design – Cohesion and coupling - Strategy of Design – Function Oriented Design – Object Oriented Design - Detailed Design - IEEE Recommended Practice for Software Design Descriptions.



  
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**UNIT- V**

Software Testing: A Strategic approach to software testing – Terminologies – Functional testing – Structural testing – Levels of testing – Validation testing - Regression testing – Art of Debugging – Testing tools - Metrics-Reliability Estimation. Software Maintenance - Maintenance Process - Reverse Engineering – Software Re-engineering - Configuration Management Activities.

**REFERENCE BOOKS**

1. An Integrated Approach to Software Engineering – Pankaj Jalote, Narosa Publishing House, Delhi, 3<sup>rd</sup> Edition.  
(Unit – I Chapters: 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 2.4)  
(Unit – IV Chapters 8.1 to 8.3)  
(Unit – V Chapter 10.6)
2. Fundamentals of Software Engineering – Rajib Mall, PHI Publication, 3<sup>rd</sup> Edition.  
(Unit – II Chapters 4.1 to 4.9, 11.3, 11.4, 11.5, 11.6)  
(Unit – III Chapters 3.1 to 3.14)  
(Unit – IV Chapters 5.1, 5.2, 5.3)
3. Software Engineering – K.K. Aggarwal and Yogesh Singh, New Age International Publishers, 3<sup>rd</sup> edition.  
(Unit – II Chapters 4.2, 4.3, 4.4, 4.5)  
(Unit – IV Chapters 5.3, 5.4, 5.5, 5.6)  
(Unit – V Chapters 8.1 to 8.8, 9.1, 9.2, 9.5, 9.6, 9.7, 9.8)
4. A Practitioners Approach- Software Engineering, - R. S. Pressman, McGraw Hill.
5. Fundamentals of Software Engineering - Carlo Ghezzi, M. Jarayeri, D. Manodrioli, PHI Publication.

| <b>QUESTION PAPER PATTERN</b>   |   |   |
|---|---|---|
| <b>SECTION - A</b>  | <b>SECTION - B</b>  | <b>SECTION - C</b>  |
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| Sem. | Course Code | CORE PRACTICAL – I     |        | Hours Per Week | Credits |
|------|-------------|------------------------|--------|----------------|---------|
|      |             | ALGORITHM AND OOPS LAB |        |                |         |
| I    | 20PBICP105  | CIA:40                 | ESE:60 | 5              | 4       |

Objective(s): On successful completion of the course the students should have:

- Practical knowledge in oops concept and C++


Course Outcomes:

At the end of the course, the students will be able to:

- CO1 Implement the concept of recursion and apply Algorithm for solving problems like searching and sorting
- CO2 Understand basic data structures such as arrays, linked lists, stacks and queues
- CO3 Solve the knapsack problem using greedy approach
- CO4 Implement the concept of virtual function and Parameterized constructor
- CO5 Implement the concept of friend function and function overloading.

1. Write a program to solve the tower of Hanoi using recursion.
2. Write a program to traverse through binary search tree using traversals.
3. Write a program to perform various operations on stack using linked list.
4. Write a program to perform various operations in circular queue.
5. Write a program to sort an array of an elements using quick sort.
6. Write a program to solve number of elements in ascending order using heap sort.
7. Write a program to solve the knapsack problem using greedy method
8. Write a program to search for an element in a tree using divide & conquer strategy.
9. Write a program to place the 8 queens on an 8X8 matrix so that no two queens Attack.
10. Write a C++ program to perform Virtual Function
11. Write a C++ program to perform Parameterized constructor
12. Write a C++ program to perform Friend Function
13. Write a C++ program to perform Function Overloading
14. Write a C++ program to perform Single Inheritance
15. Write a C++ program to perform Employee Details using files



  
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| Sem. | Course Code | CORE PRACTICAL – II<br>SOFTWARE TESTING LAB | Total Marks: 100 |        | Hours<br>Per<br>Week | Credits |
|------|-------------|---|------------------|--------|----------------------|---------|
|      |             |   | CIA:40           | ESE:60 |                      |         |
| I    | 20PBICP106  |   |                  |        | 5                    | 4       |

Objective(s): On successful completion of the course the students should have:

- Understood the concepts of Software
- Got the skill of software testing tools
- Expertise in using software testing tools

Course Outcomes:

At the end of the course, the students will be able to:

- CO1 Implement and carryout functional testing using WinRunner
- CO2 Implement testing using Silk Test
- CO3 Implement testing using LoadRunner
- CO4 Perform testing using JMeter
- CO5 Create and test bitmap checkpoints, parameterization, database application, debugging and test result evaluation using Quick Test Professional tool

Running and testing in any one of the following Testing tools:

- WinRunner
- Silk Test
- SQA Robot
- LoadRunner
- JMeter
- TestDirector
- GNU Tools ( Source Code Testing Utilities in Unix / Linux)
- Quick Test Professional

REFERENCE BOOK:

1. Dr.K.V.K.K.Prasad, Software Testing Tools, Dreamtech Press, 2007.



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| Sem. | Course Code | CORE PAPER – V<br>DATA MINING AND<br>WAREHOUSING | Total Marks: 100 |        | Hours<br>Per<br>Week | Credits |
|------|-------------|--|------------------|--------|----------------------|---------|
|      |             |  | CIA:25           | ESE:75 | 4                    |         |
| II   | 20PBICT201  |  |                  |        | 4                    | 4       |

Objective(s): On successful completion of the course the students should have:

- Understood the Association rules, Clustering Techniques and Data Warehousing.

Course Outcomes:

At the end of the course, students will be able to

- CO1 Identify appropriate data mining algorithms to solve real world problems
- CO2 Understand various classification algorithms to solve the real time problems.
- CO3 Compare and evaluate different data mining techniques like clustering and association rule mining
- CO4 Design data warehouse with dimensional modeling and apply OLAP operations.
- CO5 Identify the necessity of Data Warehousing for the society

#### UNIT- I

Basic data mining tasks – data mining versus knowledge discovery in databases – data mining issues – data mining metrics – social implications of data mining – data mining from a database perspective. Data mining techniques: Introduction – a statistical perspective on data mining – similarity measures – decision trees – neural networks – genetic algorithms.

#### UNIT- II

Classification: Introduction – Statistical – based algorithms - distance – based algorithms – decision tree - based algorithms - neural network – based algorithms –rule - based algorithms – combining techniques.

#### UNIT- III

Clustering: Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms - Partitional Algorithms. Association rules: Introduction - large item sets - basic algorithms – parallel & distributed algorithms – comparing approaches- incremental rules – advanced association rules techniques – measuring the quality of rules.

#### UNIT- IV

Data warehousing: an introduction - characteristics of a data warehouse – data marts – other aspects of data mart. Online analytical processing: introduction - OLTP & OLAP systems – data modelling –star schema for multidimensional view –data modelling – multifact star schema or snow flake schema – OLAP TOOLS, State of the market – OLAP TOOLS and the internet.



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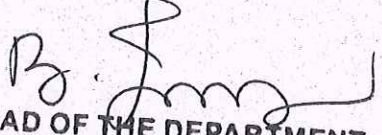
**UNIT- V**

Developing a data WAREHOUSE: why and how to build a data warehouse –data warehouse architectural strategies and organization issues - design consideration – data content – metadata distribution of data – tools for data warehousing – performance considerations – crucial decisions in designing a data warehouse. Applications of data warehousing and data mining in government: Introduction - national data warehouses – other areas for data warehousing and data mining.


**REFERENCE BOOKS**

1. Margaret H. Dunham, "Data mining introductory and advanced topics", Pearson education, 2003.
2. C.S.R. Prabhu, "Data warehousing concepts, techniques, products and a applications", PHI, Second Edition.
3. ArunK.Pujari, " Techniques", Universities Press (India) Pvt. Ltd., 2003.
4. Alex Berson, Stephen J. Smith, "data warehousing, data mining, & OLAP, TMCH, 2001.
5. Jiawei Han & MichelineKamber, " Data mining Concepts & Techniques", 2001. Academic press

| <b>QUESTION PAPER PATTERN</b>   |   |   |
|---|---|---|
| <b>SECTION – A</b>  | <b>SECTION - B</b>  | <b>SECTION - C</b>  |
| <b>10 × 1 = 10 Marks</b><br>(Multiple Choice, Four options)<br>Two questions from each unit | <b>5 × 7 = 35 Marks</b><br>(Either or choice)<br>Two questions from each unit | <b>3 × 10 = 30 Marks</b><br>(Answer any three Questions)<br>One question from each unit |

  
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| Sem. | Course Code | CORE PAPER – VI<br>ADVANCED OPERATING<br>SYSTEMS | Total Marks: 100 |        | Hours<br>Per<br>Week | Credits |
|------|-------------|--|------------------|--------|----------------------|---------|
|      |             |  | CIA:25           | ESE:75 |                      |         |
| II   | 20PBICT202  |  |                  |        | 4                    | 4       |

Objective(s): On successful completion of the course the students should have:

- Gained knowledge on Distributed Operating Systems.
- Gained insight into the components and management aspects of real time and mobile operating systems.

Course Outcomes:

At the end of the course, the students will be able to:

- CO1 Understand the basics of Operating System
- CO2 Apply and analyse the concept of deadlock.
- CO3 Understand the concept of real time operating systems
- CO4 Understand the Operating Systems for Handheld Systems
- CO5 Understand the architecture of LINUX and internal representation of files.

#### UNIT- I

Basics of Operating Systems: What is an Operating System – Main frame Systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real-Time Systems – Handheld Systems – Feature Migration – Computing Environments - Process Scheduling – Cooperating Processes – Inter Process Communication- Deadlocks – Prevention – Avoidance – Detection – Recovery.

#### UNIT- II

Distributed Operating Systems: Issues – Communication Primitives – Lamport's Logical Clocks – Deadlock handling strategies – Issues in deadlock detection and resolution - distributed file systems –design issues – Case studies – The Sun Network File System-Coda.

#### UNIT- III

Realtime Operating Systems : Introduction – Applications of Real Time Systems – Basic Model of Real Time System – Characteristics – Safety and Reliability - Real Time Task Scheduling.

#### UNIT- IV

Operating Systems for Handheld Systems: Requirements – Technology Overview – Handheld Operating Systems – PalmOS-Symbian Operating System- Android –Architecture of android – Securing handheld systems

#### UNIT- V

Case Studies :Linux System: Introduction – Memory Management – Process Scheduling – Scheduling Policy - Managing I/O devices – Accessing Files- iOS : Architecture and SDK Framework - Media Layer - Services Layer - Core OS Layer - File System.



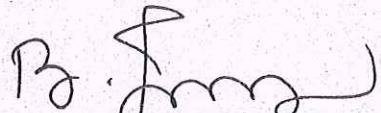
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**REFERENCE BOOKS:**

1. Abraham Silberschatz; Peter Baer Galvin; Greg Gagne. "Operating System Concepts", Seventh Edition, John Wiley & Sons, 2004.
2. MukeshSinghal and Niranjana G. Shivaratri, "Advanced Concepts in Operating Systems – Distributed, Database, and Multiprocessor Operating Systems", Tata McGraw-Hill, 2001
3. Rajib Mall, "Real-Time Systems: Theory and Practice", Pearson Education India, 2006.
4. Pramod Chandra P.Bhatt, An introduction to operating systems, concept and practice, PHI, Third edition, 2010
5. Daniel.P.Bovet& Marco Cesati,"Understanding the Linux kernel",3rd edition,O'Reilly, 2005
6. Neil Smyth, "iPhone iOS 4 Development Essentials – Xcode", Fourth Edition, Payload media, 2011

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| Sem. | Course Code | CORE PAPER – VII<br>ADVANCED JAVA<br>PROGRAMMING | Total Marks: 100 |        | Hours<br>Per<br>Week | Credits |
|------|-------------|--|------------------|--------|----------------------|---------|
|      |             |  | CIA:25           | ESE:75 | 4                    | 4       |
| II   | 20PBICT203  |  |                  |        |                      |         |

Objective(s): On successful completion of the course the students should have:

- Acquired skill in advanced java programming.

Course Outcomes:

At the end of the course, students will be able to

- CO1 Understand the syntax and semantics of the Java language
- CO2 Invoke the remote methods in an application using Remote Method Invocation
- CO3 Access database using Java Data Base Connectivity in web applications
- CO4 Create dynamic web pages, using Servlets and JSP
- CO5 Solve real-world applications through JQuery

#### UNIT- I

Java Basics Review: – Basics of a typical JAVA environment – Arithmetic, Equality and Relational Operators – Thinking about Objects- Applet – Control Structures: if, if/else, while, for, switch, do/while, break and continue – Operators: Assignment, Increment and Decrement and Logical – Primitive Data types- Methods -Components and event handling – Threading concepts

#### UNIT- II

Networking features – Media techniques-Remote Method Invocation-Distributed Application Architecture- Creating stubs and skeletons- Defining Remote objects- Remote Object ActivationObject Serialization-Java Spaces

#### UNIT- III

Java in Databases- JDBC principles – database access- Interacting- database search – Creating multimedia databases – Database support in web applications

#### UNIT- IV

Java Servlets: Java servlet and CGI programming- A simple java servlet-Anatomy of a java servlet-Reading data from a client-Reading http request header-sending data to a client and writing the http response header-working with cookies Java Server Pages: JSP Overview-Installation-JSP tags-Components of a JSP page-Expressions-Scriptlets-Directives-Declarations-A complete example

#### UNIT- V

JAR file format creation – Internationalization – Swing Programming – JQuery: Introduction - Adding JQuery to Web pages- JQuery Editor-JQuery Selectors and Elements- Animations and Events handling in JQuery



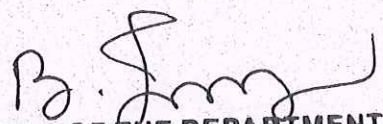
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## REFERENCE BOOKS:

1. Jamie Jaworski, "Java Unleashed", SAMS Techmedia Publications, 1999
2. Campione, Walrath and Huml, "The Java Tutorial", Addison Wesley, 1999
3. Jim Keogh, "The Complete Reference J2EE", Tata McGrawHill Publishing Company Ltd, 2010
4. David Sawyer McFarland, "Javascript And Jquery- The Missing Manual", Oreilly Publications, 3rd Edition, 2011
5. Deitel and Deitel, "Java How to Program", Third Edition, PHI/Pearson Education Asia.

| QUESTION PAPER PATTERN   |  |  |
|--|--|--|
| SECTION – A  | SECTION - B  | SECTION - C  |
| 10 × 1 = 10 Marks<br>(Multiple Choice, Four options)<br>Two questions from each unit | 5 × 7 = 35 Marks<br>(Either or choice)<br>Two questions from each unit | 3 × 10 = 30 Marks<br>(Answer any three Questions)<br>One question from each unit |

  
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| Sem. | Course Code | CORE PAPER – VIII<br>ARTIFICIAL<br>INTELLIGENCE &<br>EXPERT SYSTEMS | Total Marks: 100 |        | Hours<br>Per<br>Week | Credits |
|------|-------------|---|------------------|--------|----------------------|---------|
|      |             |   | CIA:25           | ESE:75 | 4                    | 4       |
| II   | 20PBICT204  |   |                  |        |                      |         |

Objective(s): On successful completion of the course the students should have:

- Understood the AI & Expert Systems.
- Learnt the Heuristic techniques and reasoning

Course Outcomes:

At the end of the course, students will be able to

- CO1 Understand the AI problems and techniques to solve the problem
- CO2 Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- CO3 Ability to represent simple facts in Logic
- CO4 Understand automatic reasoning
- CO5 Describe the concepts central to the creation of knowledge bases and expert systems.

#### UNIT- I

Introduction: AI Problems - AI techniques - Criteria for success. Problems, Problem Spaces, Search: State space search - Production Systems - Problem Characteristics - Issues in design of Search.

#### UNIT- II

Heuristic Search techniques: Generate and Test - Hill Climbing- Best-First, Problem Reduction, Constraint Satisfaction, Means-end analysis. Knowledge representation issues: Representations and mappings -Approaches to Knowledge representations -Issues in Knowledge representations - Frame Problem.

#### UNIT- III

Using Predicate logic: Representing simple facts in logic - Representing Instance and Isa relationships - Computable functions and predicates - Resolution - Natural deduction. Representing knowledge using rules: Procedural Vs Declarative knowledge - Logic programming - Forward Vs Backward reasoning - Matching - Control knowledge.

#### UNIT- IV

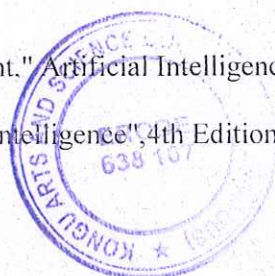
Statistical reasoning – Knowledge representation – Planning– Understanding.

#### UNIT- V

Learning – Common sense – Perception and Action – Expert System.

#### REFERENCE BOOKS

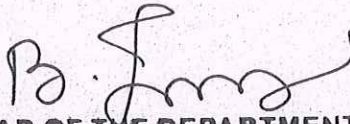
1. Elaine Rich and Kevin Knight." Artificial Intelligence", Tata McGraw Hill Publishers company Pvt Ltd, Second Edition, 1991.
2. George F Luger, "Artificial Intelligence",4th Edition, Pearson Education Publ,2002.



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| QUESTION PAPER PATTERN   |   |  |
|--|---|--|
| SECTION – A  | SECTION - B   | SECTION - C  |
| 10 × 1 = 10 Marks<br>(Multiple Choice, Four options)<br>Two questions from each unit | 5 × 7 = 35Marks<br>(Either or choice)<br>Two questions from each unit | 3 × 10 = 30 Marks<br>(Answer any three Questions)<br>One question from each unit |

  
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| Sem. | Course Code | ELECTIVE – I<br>MULTIMEDIA AND<br>ITS APPLICATIONS | Total Marks: 100 |        | Hours<br>Per<br>Week | Credits |
|------|-------------|--|------------------|--------|----------------------|---------|
|      |             |  | CIA:25           | ESE:75 | 4                    | 4       |
| II   | 20PBIET205  |  |                  |        |                      |         |

Objective(s): On successful completion of the course the students should have:

- Understood the Multimedia animation and Desktop Computing.

Course Outcomes:

At the end of the course, students will be able to

- CO1 Understand the basic concept of multimedia and its tools
- CO2 Understand the characteristics of multimedia authoring tools and building blocks
- CO3 Understand the representations of different multimedia data
- CO4 Apply acquired knowledge in designing World Wide Web
- CO5 Describe High Definition Television and Desktop Computing

#### UNIT- I

What is Multimedia – Introduction to making Multimedia – Macintosh and Windows Production platforms – Basic Software tools.

#### UNIT- II

Making Instant Multimedia – Multimedia authoring tools – Multimedia building blocks – Text – Sound.

#### UNIT- III

Images – Animation – Video.

#### UNIT- IV

Multimedia and the Internet – The Internet and how it works – Tools for World Wide Web – Designing for the World Wide Web.

#### UNIT- V

High Definition Television and Desktop Computing – Knowledge based Multimedia systems.

#### REFERENCE BOOKS

1. Tay Vaughan, "Multimedia making it work", Fifth Edition, Tata McGraw Hill.
2. John F. Koegel Bufford, "Multimedia Systems", Pearson Education.
3. Judith Jeffloat, "Multimedia in Practice (Technology and Applications)", PHI, 2003

| QUESTION PAPER PATTERN   |   |  |
|--|---|--|
| SECTION – A  | SECTION - B   | SECTION - C  |
| 10 × 1 = 10 Marks<br>(Multiple Choice, Four options)<br>Two questions from each unit | 5 × 7 = 35Marks<br>(Either or choice)<br>Two questions from each unit | 3 × 10 = 30 Marks<br>(Answer any three Questions)<br>One question from each unit |

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| Sem. | Course Code | ELECTIVE – I     | Total Marks: 100 |        | Hours Per Week | Credits |
|------|-------------|------------------|------------------|--------|----------------|---------|
| II   | 20PBIET206  | EMBEDDED SYSTEMS | CIA:25           | ESE:75 | 4              | 4       |

Objective(s): On successful completion of the course the students should have:

- Understood the Instruction Set and Programming.
- Understood the Embedded software development

Course Outcomes:

At the end of the course, students will be able to

- CO1 Understand the technologies behind the embedded computing systems.
- CO2 Analyze the architectures for Embedded Systems
- CO3 Understand the real time embedded systems using the concepts of RTOS
- CO4 Understand the design issues of Embedded Systems
- CO5 Understand the requirements of programming Embedded Systems

#### UNIT- I

8051 Microcontroller: Introduction - 8051 Architecture-Input/Output Pins, Ports and Circuits - External Memory - Counters / Timers - Serial Data Input / Output - Interrupts.

#### UNIT- II

Instruction Set and Programming Moving Data-Addressing Modes-Logical operations Arithmetic Operation-Jump and Call Instructions-Simple Program. Applications: Keyboard Interface - Display Interface-Pulse Measurements-DIA and AID Conversions-Multiple Interrupts.

#### UNIT- III

CONCEPTS ON RTOS: Introduction to RTOS-Selecting an RTOS-Task and Task states - Tasks and data- Semaphores and shared data. MORE operating systems services: Interrupt Process communication - Message Queues, Mailboxes and pipes- Timer Functions-Events - Memory Management-Interrupt Routines in an RTOS Environment.

#### UNIT- IV

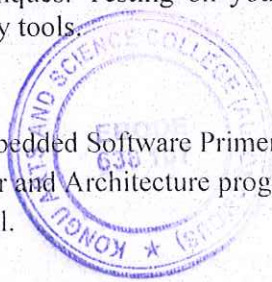
Basic Design using a RTOS: Principles - Encapsulating semaphores and Queues-Hard real time scheduling considerations-Saving memory space and power- introductions to RTL & QNX.

#### UNIT- V

SOFTWARE TOOLS: Embedded software Development Tools:Hosts and Target Machines Linker/Locators for Embedded software-getting Embedded software into the Target systems. Debugging Techniques: Testing on your Host machine -Instruction set simulators- The assert macro using laboratory tools.

#### REFERENCE BOOKS

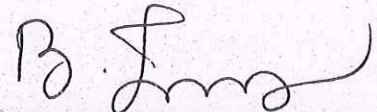
1. David.E.Simon, "An Embedded Software Primer", Pearson Education-2001.
2. The 8051 Microcontroller and Architecture programming and application II Edition -Kenneth J Ayala- Penram International.



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| QUESTION PAPER PATTERN  |  |   |
|---|--|---|
| SECTION - A   | SECTION - B  | SECTION - C   |
| <b>10 × 1 = 10 Marks</b><br>(Multiple Choice, Four options)<br>Two questions from each unit | <b>5 × 7 = 35Marks</b><br>(Either or choice)<br>Two questions from each unit | <b>3 × 10 = 30 Marks</b><br>(Answer any three Questions)<br>One question from each unit |



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| Sem. | Course Code | ELECTIVE – I    | Total Marks: 100 |        | Hours Per Week | Credits |
|------|-------------|-----------------|------------------|--------|----------------|---------|
| II   | 20PBIET207  | PHP PROGRAMMING | CIA:25           | ESE:75 | 4              | 4       |

Objective(s): On successful completion of the course the students should have:

- Understood the features like functions, forms in PHP.
- Understood files handling, OOPS concepts, Cookies, Sessions and Database, draw images on the server with AJAX.
- Acquired skills to write PHP programs.

Course Outcomes:

At the end of the course, students will be able to

- CO1 Formulate, design and create PHP control structures, including selection and iterative structures
- CO2 Implement the OOP's concept in PHP Scripts
- CO3 Create a PHP Scripts for file handling
- CO4 Implement session and cookies
- CO5 Draw images on the server with AJAX

#### UNIT- I

PHP: Introduction – Essential PHP – Operators and Flow control: Working with math, assignment, increment and decrement, string, bitwise, execution, comparison and logical operators, Working with loops – Strings and Arrays.

#### UNIT- II

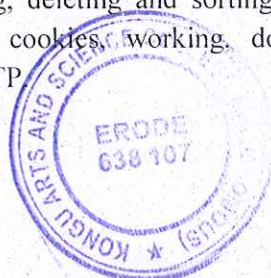
PHP Functions and Browser handling power: Creating Functions, passing functions, passing arrays, pass by reference, default arguments, returning data, arrays, lists, references, accessing global data, working with static variables, PHP conditional functions, variable functions, nesting functions – Reading data in web pages: Handling text fields, areas, check boxes, radio buttons, list boxes, password controls, hidden controls, image maps, file uploads, buttons – PHP Browser handling power.

#### UNIT- III

Working with Object oriented programming and File handling: Object oriented programming: creating classes, objects, setting access to properties and methods, using constructors and destructors, inheritance, overriding and overloading methods, auto loading classes – File Handling: open, read, close, parsing files, copy, delete, write and append files.

#### UNIT- IV

Working with databases and setting sessions, cookies and FTP: Databases: creating, accessing, updating, inserting, deleting and sorting databases – Setting sessions, cookies and FTP: setting, reading, deleting cookies, working, downloading, uploading, deleting, creating and removing directories with FTP



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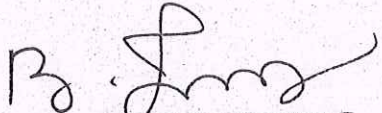
**UNIT- V**

AJAX and Drawing Images on the server: Ajax: Handling AJAX requests, downloading images using AJAX, downloading javascript with AJAX– Drawing images on the server: creating and displaying images, drawing lines, rectangles, ellipse, arcs, polygons, figures, individual pixels, text, virtual text, working with image files, tiling images, copying images.


**REFERENCE BOOKS:**

1. "The Complete Reference PHP Covers PHP 5.2", Steven Holzner, Tata McGraw-Hill Edition 2008.
2. PHP6 and MySQL6 Bible – Steve Svehring
3. PHP Programming Solutions – VickramViswani

| QUESTION PAPER PATTERN  |   |   |
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| <b>10 × 1 = 10 Marks</b><br>(Multiple Choice, Four options)<br>Two questions from each unit | <b>5 × 7 = 35 Marks</b><br>(Either or choice)<br>Two questions from each unit | <b>3 × 10 = 30 Marks</b><br>(Answer any three Questions)<br>One question from each unit |

  
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| Sem. | Course Code | CORE PRACTICAL – III<br>ADVANCED JAVA<br>PROGRAMMING LAB | Total Marks: 100 |        | Hours<br>Per<br>Week | Credits |
|------|-------------|--|------------------|--------|----------------------|---------|
| II   | 20PBICP208  |  |                  | CIA:40 | ESE:60               | 5       |

Objective(s): On successful completion of the course the students should have:

- Acquired knowledge in Java Programming.

Course Outcomes:

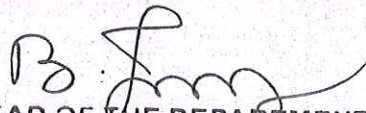
At the end of the course, students will be able to

- CO1 Handle HTML form data with Java Servlet
- CO2 Invoke the remote methods in an application using Remote Method Invocation
- CO3 Access database using Java Data Base Connectivity in web applications
- CO4 Create dynamic web pages, using Servlets and JSP
- CO5 Create an applet application

1. Display a welcome message using Servlet.
2. Design a Purchase Order form using Html form and Servlet.
3. Develop a program for calculating the percentage of marks of a student using JSP.
4. Design a Purchase Order form using Html form and JSP.
5. Prepare an Employee pay slip using JSP.
6. Write a program using JDBC for creating a table, Inserting, Deleting records and list out the records.
7. Write a program using Java servlet to handle form data.
8. Write a simple Servlet program to create a table of all the headers it receives along with their associated values.
9. Write a program in JSP by using session object.
10. Write a program to build a simple Client Server application using RMI.
11. Create an applet for a calculator application.
12. Program to send a text message to another system and receive the text message from the system (use socket programming)



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| Sem. | Course Code | CORE PRACTICAL –IV      | Total Marks: 100 |        | Hours Per Week | Credits |
|------|-------------|-------------------------|------------------|--------|----------------|---------|
| II   | 20PBICP209  | DATA MINING USING R LAB | CIA: 40          | ESE:60 | 5              | 4       |

Objective(s): On successful completion of the course the students should have:

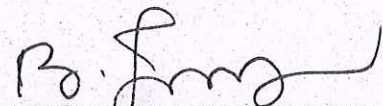
- Acquired a practical knowledge in R.

Course Outcomes:

At the end of the course, students will be able to

- CO1 Extract association rule using R
- CO2 Implement k-means clustering using R
- CO3 Implement classification algorithm using R
- CO4 Predict quantitative variable using R
- CO5 visualize data using R.

1. Implement Apriori algorithm to extract association rule of data mining.
2. Implement k-means clustering technique.
3. Implement any one Hierarchical Clustering.
4. Implement Classification algorithm.
5. Implement Decision Tree.
6. Linear Regression.
7. Data Visualization



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# **KONGU ARTS AND SCIENCE COLLEGE**

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# **ACTIVITIES**





**KONGU ARTS AND SCIENCE COLLEGE  
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**DEPARTMENT OF COMPUTER SCIENCE (P.G.)**

**One Day Virtual Webinar on Health Care Analytics  
24 July 2020**

**KONGU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)**  
NANJANAPURAM, ERODE - 638 107

**DEPARTMENT OF COMPUTER SCIENCE (P.G.)**

**INAUGURATION OF ASSOCIATION ACTIVITIES 2020 - 2021**

**PRESIDENTIAL ADDRESS**  
Thiru.K.Palanisamy  
Correspondent, KASC

**FELICITATION**  
Dr.N.Raman  
Principal, KASC

**Association of ITxcels**

**RESOURCE PERSON**  
Dr. A. Jaya M.C.A., M.E., Ph.D., M.B.A.(B. Business)  
Professor,  
Department of Computer Applications,  
B.S. Abdur Rahman Crescent Institute of  
Science and Technology,  
Chennai.

**DATE: 24-07-2020**  
**TIME: 10 am**

**Topic: Health Care Analytics**

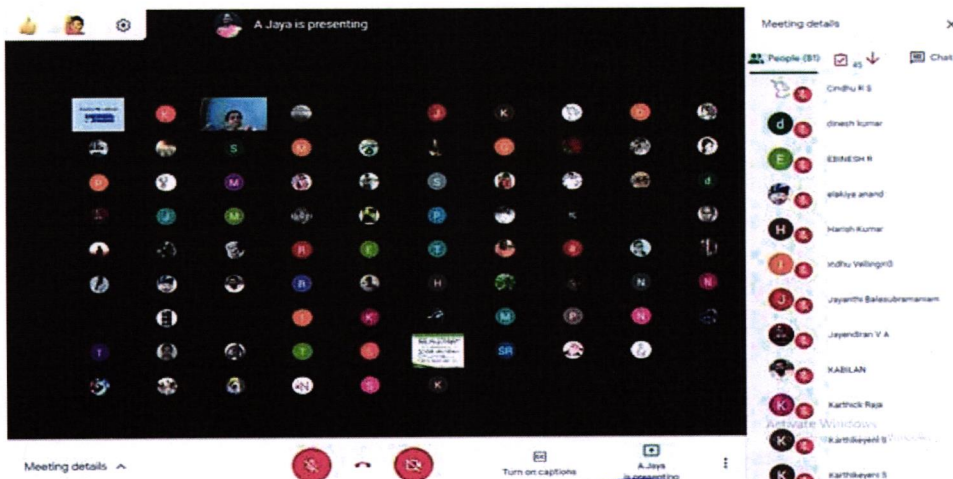
**INAUGURATION THROUGH**

<https://meet.google.com/ner-ppm-rq>

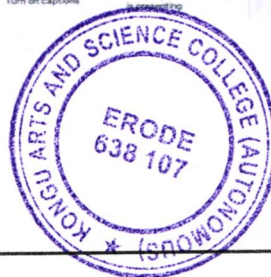
The Department of Computer Science (P.G.) organized an Inauguration cum **One Day Virtual Webinar on “Health Care Analytics” on 24 July 2020**. The Resource Person for this webinar was **Dr. A.Jaya, Professor, Department of Computer Applications, B.S. Abdur Raham Crescent Institute of Science and Technology, Chennai.**

The objective of this webinar is to impart knowledge on Health Care Analytics. This webinar was attended by Research Scholars, MCA and BioTechnology department students. The resource person explains how data analytics is used in health care and also demonstrates the implementation with some examples. The queries of the participants were clarified at the end of the webinar.

**No of Beneficiaries: 76 (Students – 69, Faculty – 7)**



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*Dr. N. Raman*  
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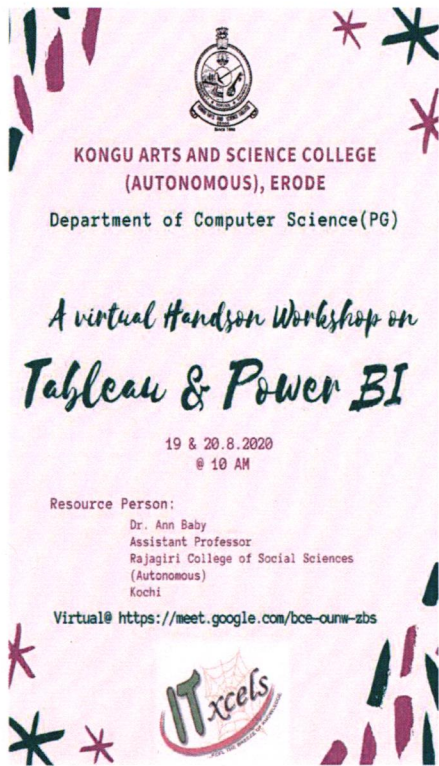




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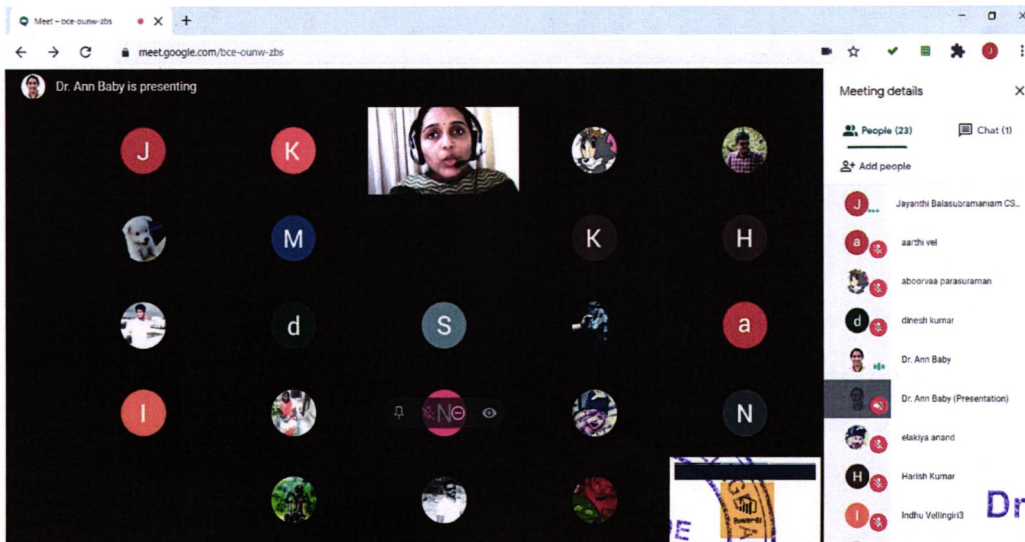
**DEPARTMENT OF COMPUTER SCIENCE (P.G.)**

**Two Days A Virtual Hands-on Workshop on Tableau & Power BI  
19 August 2020 & 20 August 2020**



The Department of Computer Science organized a Two Days A Virtual Hands-on Workshop on “Tableau and Power BI” on 19 August 2020 and 20 August 2020. The Resource Person for this workshop was **Dr. Ann Baby, Assistant Professor, Department of MCA, Rajagiri College of Social Sciences (Autonomous), Kochi.**

The objective of this workshop is to impart knowledge on Tableau and Power BI Programming. This webinar was attended by Research Scholars, Faculty members and students of MCA, B.Sc(CS), B.Sc(C/IT) & B.Com(CA) departments. The resource person demonstrates the implementation of data in Tableau and Power BI Programming with sample programs. The queries of the participants were clarified at the end of the webinar. Around 44 students and staffs were participated in this programme



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