| ST. ALOYSIUS' COLLEGE(AUTONOMOUS) JABALPUR | | | | |
|---|---|---|---|---|
| **PART A: Introduction** | | | | |
| Program: Diploma | Session: **2023-24** | Class: BCA | Year: III SEM | SESSION: 2023-24 |
| Subject: **Computer Application (BCA)** | | | | |
| 1. Course Code | | S2-BCAA1T | | |
| 2. Course Title | | **Data Communication and Computer Networks** | | |
| 3. Course Type | | **Major** | | |
| 4. Pre-Requisite (if any) | | To study this course, a student must have the basic knowledge of Computers. | | |
| **5.** Course learning outcome(CLO) | • Demonstrate the Basic Concepts of Networking, Networking Principles, Routing Algorithms, IP Addressing and working of Networking Devices.<br>• Demonstrate the significance, purpose and application of Networking protocols and Standards.<br>• Describe, compare and contrast LAN, WAN, MAN, Intranet, Internet, AM, FM, PM and Various Switching Techniques.<br>• Explain the working of Layers and apply the various protocols of OSI & TCP/IP model.<br>• Analyze the Requirement for a given Organizational structure and select the most appropriate Networking Architecture and Technologies.<br>• Design the Network Diagram and solve the Networking problems of the Organization with consideration of Human and Environment install and configure the networking device. | | | |
| 6. Credit Value | Theory—6 Credits | | | |
| **7.** Total Marks | Max. Marks: **40+60** | Min. Passing Marks: 35 | | |
| **PART B: Content of the Course** | | | | |
| Lectures (in hours per week): 3 Hrs. per week | | | | |
| Total No. of Lectures (in hours): 90 Hrs. | | | | |

| Unit | Topics | No. of Lectures |
|---|---|---|
| I | Network goals and application, Network structure, Network services, Example of network and Network Standardization, Networking models: centralized, distributed and collaborative. Network Topologies: Bus, Star, Ring, Tree, Hybrid: Selection and Evaluation factors. | 15 |
| II | Theoretical basis for Data communication, Transmission media, Twisted pair, Coaxial Cable, Fiber optics: Selection and Evaluation factors Line of Sight Transmission, Communication Satellites. Analog and Digital transmission. Transmission and switching, frequency division and time division multiplexing, Circuit switching, packet. Switching and message switching. | 20 |
| III | Brief overview of LAN (local area network) Classification, Brief overview of Wide Area Network (WAN). Salient features and difference of LAN with emphasis on Media, Speed of Transmission, | 20 |

| | | |
|---|---|---|
| | Terminal Handling, Polling, Token passing, Contention IEEE Standards their need and developments. | |
| IV | Open System: What is an Open System? Network Architectures is OSI Reference Model, Layers: Application, Presentation, Session, Transport, Network, Data Link & Physical Layer - Transmission, Bandwidth, Signaling devices used, media type. Data Link Layer - : Addressing, Media Access Methods, Logical link Control. | 20 |
| V | Routing: Fewest-Hops routing, Type of Service routing, Bridges and Routers, Gateway protocols, routing daemons. OSI and TCP/IP model. TCP/IP and Ethernet. The Internet: The structure of the Internet, the internet layers, Internetwork problems. Internet Standards. | 15 |

## PART C: Learning Resources

Textbooks, Reference Books, Other Resources

### Suggested Readings

1. Tannanbaum, A.S.: Computer Networks, Prentice Hall, 1 985.processing, Prentice Hall,1983.
2. Black : Computer Networks : Protocols, standards and Interfaces, Prentice Hall International I. Tannanbaum, A.S.: Computer Networks, Prentice Hall, 1985.processing, Prentice Hall, 1983.
3. Fourauzan B., "Data Communications and Networking", 3rd edition, TataMcGraw- Hill Publications,

Reference Books:

1. Comer· D., "Computer Networks and Internet", 2ND Edition, PearsonEducation
2. S.K.Basandra& S. Jaiswal, "Local Area Networks", Galgotia Publications
3. William Stallings, "Data and Computer Communication"
4: Book published by M.P. Granth Academy, Bhopal

Suggested Web Links:

https://www.nptel.ac. in/courses/106/105/106105082/
https://www. iitkg . ac
https://www.nptel.ac.in/course. html
https://www.harvard.edu/subject/computer-networking
http://www.m12hindigranthacademy.org/
http://www.mphindigranthacademy.org/

| Part D-Assessment and Evaluation | | |
|---|---|---|
| Suggested Continuous Evaluation Methods: Maximum Marks: 100 | | |
| Continuous Comprehensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks | | |
| **Internal Assessment** Continuous Comprehensive Evaluation (CCE): 40 | Class Test Assignment/Presentation | Total 40 |
| **External Assessment** University Exam Section: 60 | Section (A) : Objective Questions Section (B): Short Questions Section (C): Long Questions | Total 60 |

## St. Aloysius' College (Autonomous), Jabalpur

### Part A – Introduction

| | |
|---|---|
| **Session:** | 2023-24 |
| **Subject** | Computer Application |
| **Programme** | Diploma |
| **Class** | BCA III Semester |
| **Course Code** | S2-BCAA2T |
| **Course Type** | Minor |
| **Course Title** | **Database Management Systems** |
| **Pre–requisite** | To study this course, a student must have the basic knowledge of Computers. |
| **Course Learning Outcome** | After completion of this course, it is expected that the student shall be able<br>CO1. Explain the features of database management systems and relational database.<br>CO2. Design conceptual models of a database using ER modeling for real life applications and construct queries in relational algebra.<br>CO3. Create and populate a RDBMS for a real-life application, with constraints and keys, using SQL.<br>CO4. Retrieve any type of information from a database by formulating complex queries in SQL.<br>CO5. Analyse the existing design of a database schema and apply concepts of normalization to design an optimal database. |
| **Credit Value** | **4 credits (4-TH)** |

| **Total Marks** | Max. Marks: 40+60 | Min. Passing Marks:35 |
|---|---|---|

### Part B – Course Content
Total No. of Lectures-Tutorials-Practical (in hours per week): L-4

| Unit I | **Introduction to DBMS:** Why database? Characteristics of datain database, D B M S . What are advantages of DBMS?<br><br>**Database Architecture and Modeling:** Conceptual, physical and logical database models, Role of DBA, Database design.<br><br>**Entity Relationship (ER) Model:** Components of ER-model, ER modeling symbols, Relationships, Specialization, Generalization, Aggregation. |
|---|---|
| Unit II | **Relational database implementation**<br><br>**Relational Implementation with SQL:** Schema and Table Definition: Schema definition (CREATE), Data types & domains, Defining Tables, Column Definition.<br><br>Data Manipulation: Simple Queries (SELECT, FROM, WHERE), Built-ln Functions (SUM, AVG, COUNT, MAX, and MIN).GROUP BY, ORDER BY and HAVING clause. Database Change Operations: INSERT, UPDATE, DELETE. |

| Unit III | **Relational database implementation:** Multiple Table Queries-Subqueries, EXISTS and NOT EXISTS operators.<br>**Relational Algebra and Calculus**<br>Relational Algebra: Union, Intersection, Difference, Product, Select, Project, Join - Natural, Theta & Outer Join, Divide, Assignment.<br>Relational Algebra Operations with SQL: UNION, INTERSECT, EXCEPT. |
|---|---|
| Unit IV | **The Relational Data Model:**<br><br>*Fundamental Concepts:* Relations, Null Values, Keys, Foreign Keys, Integrity Constraints - Entity Integrity & Relational Integrity.<br><br>*Normalization Process:* First Normal Form, Functional Dependencies, Second Normal Form, Third Normal Form, Boyce-Codd Normal Form (BCNF), Fourth Normal Form; Other Normal Forms - Fifth Normal Form & Domain/Key Normal Form. |
| Unit V | **Physical Database Systems**<br><br>Overview of Physical Storage Media, Magnetic Disk and Flash Storage, RAID, RAID Levels, Choice of RAID level.<br>*Physical Storage Media.* Secondary Storage, Physical Storage Blocks.<br>*Data Storage Formats on Disk:* Track Format, Record Format—Fixed-Length Records & Variable-Length Records, Input/output Management.<br>*File Organizing and Addressing Methods:* Sequential File Organization, Indexed- Sequential File Organization, Direct File Organization, Data Dictionary Storage. |

## Part C – Suggested Readings

| S. N. | Author | Name of the Book | Publication |
|---|---|---|---|
| 1 | Gary W. Hansen & James V. Hansen | Database Management and Design | Prentice Hall of India Pvt Ltd. |
| 2 | Ramez Elmasri, Shamkant Navathe | Fundamentals of Database Systems | Pearson |
| 3 | Raghu Ramakrishnan & Johannes Gehrke | Database Management Systems | McGraw Hill Education |
| 4 | C.J. Date | An Introduction to Database System | Pearson |
| 5 | Abraham Silberschatz , Henry F. Korth, S. Sudharshan | Database System Concepts | Tata McGraw Hill |

| Attainment Expressions | PO Mapping | PSO mapping | Cognitive level |
|---|---|---|---|
| Identifying basic problem of real world with abstract requirement (CO1, CO2) | PO2 | PSO4 | R, U |
| Applying advanced and basic queries on real databases (CO3, CO4,CO5) | PO2, PO3 | PSO4, PSO7 | AP |

| PART A: **INTRODUCTION** | | | | |
|---|---|---|---|---|
| Program: Diploma | Class: BCA | | Year. III Semester | Session: **2023-24** |
| Subject: **Computer Applications** | | | | |
| 1. | Course Code | | **S2-BCAA2P** | |
| 2. | Course Title | | **DBMS** | |
| 3. | Course Type | | Minor | |
| 4. | Pre-Requisite (if any) | | To study this course, a student must have the basic knowledge of Computers. | |
| 5. | Course Learning Outcomes (CLO) | | This lab is based on the theory course of DBMS. This lab course Involves the development of the practical skills in DBMS using MS-Access/Visual-FoxPro/SQL-Server/etc. This course is an attempt to upgrade and enhance student's theoretical skills and provide the hands-on experience. After completing this lab course sessions, student will be able: <br><br> • to create Databases & Views, <br> • execute simple advance SQL queries, <br> • use DBMS tools in the areas of database applications. <br><br> Topics to be covered in the lab syllabus- <br><br> • Introduction to MS-Access/Visual-FoxPro/SQL-Server/etc <br> • Hands on practice on the application package used in the lab(i.e. on MS-Access/Visual-FoxPro/SQL-Server/etc) <br> • Database creation using MS-Access/Visual-FoxPro/SQL-Server/etc <br> • Simple SQL queries (Single table) <br> • Use of Advanced SQL queries | |
| 6. | Credit Value | | 2 credits (2-PR) | |
| 7. | Total Marks | | Max. Marks: 40 Int + 60 Ext | Min. Passing Marks: 35 |
| PART B: **CONTENT OF THE COURSE** | | | | |
| Total No. of Lectures-Tutorials-Practical (in hours per week): P – 2 | | | | |
| Total timber of Practical: **02 Hours per Week** | | | | |

**List of Practical's**

**1. To draw ER Model and Relational Model for a given database.
Show ER to Relational Model reduction.**

**2. Implementation of Database**

- Creation of Database with proper constraints

- Insert into database using different types of insert statements

- Display

**3. Data Definition (schema) Modification**

**4. Simple SQL queries (Single table retrieval)**

- Make use of different operators (relational, logical etc.)

- Selection of rows and columns, renaming columns, use of distinct keyword

- String handling (%, etc.)

- Update statement

- Delete

**5. Advanced SQL Queries-1**

- Group by, having clause, aggregate functions

- Set operations like union, union all and use of order by clause

- Nested queries: in, not in, exists, not exists and any, all

**6. Advanced SQL Queries -2**

- Join (Inner & Outer)

- Exists & Union

| PART C: LEARNING RESOURCES |
|---|
| Textbooks, Reference Books, Other Resources |
| **Suggested Readings:** |
| 1. SQL, PL/SQL-The programming language of ORACLE, Ivan Bayross, BPB publication. <br> 2. Dr Rajeev Chopra, ―Database Management System (DBMS) A Practical Approach‖, 2010, S Chand <br> 3. Jitendra Patel, ―DBMS Lab Manual‖ Kindle Edition, 2012. |
| *Suggestive digital platform web* finds |
| https://_•fec.kai.nic.in/i'aibag/FileHandler/270-101d6l_6b-255a-4add-8d9bdd__e22fec7c1.pdf <br> https://nesitsoiith.pes.edu/pdf/2019/3u1v/CS/LM DBMS%20LAB.ndf <br><br> http://www.mphindigranthacademy.org/ |
| *Suggested equivalent online courses* |
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<tbody>
<tr><td colspan="5" align="center"><b>ST. ALOYSIUS' COLLEGE(AUTONOMOUS) JABALPUR</b></td></tr>
<tr><td colspan="5" align="center"><b>PART A: Introduction</b></td></tr>
<tr><td>Program: Diploma</td><td>Session: <b>2023-24</b></td><td>Class: BCA</td><td>Year: III Semester</td><td>SESSION: 2023-24</td></tr>
<tr><td colspan="5">Subject: <b>Computer Application (BCA)</b></td></tr>
<tr><td colspan="2">8. Course Code</td><td colspan="3">S2-BCAC 1 G</td></tr>
<tr><td colspan="2">9. Course Title</td><td colspan="3"><b>Internet of Things (IOTs)</b></td></tr>
<tr><td colspan="2">10. Course Type</td><td colspan="3">Elective</td></tr>
<tr><td colspan="2">11. Pre-Requisite (if any)</td><td colspan="3">Students must have basic Computer Knowledge</td></tr>
<tr><td colspan="2">12. Course learning outcome</td><td colspan="3"><ul><li>CO1. To understand the basics of the Internet of Things</li><li>CO2. To get an idea of some of the application areas where the Internet of Things can be applied.</li><li>CO3. To understand the middleware for the Internet of Things and the concepts of the Web of Things.</li><li>CO4. To understand the concepts of the Cloud of Things with an emphasis on Mobile cloud computing.</li><li>CO5. To understand the IOT protocols.</li></ul></td></tr>
<tr><td colspan="2">13. Credit Value</td><td>Theory—3Credits</td><td colspan="2">Practical— 1 Credits</td></tr>
<tr><td colspan="2"><b>14.</b> Total Marks</td><td>Max. Marks: 4<b>0+60</b></td><td colspan="2">Min. Passing Marks: 35</td></tr>
<tr><td colspan="5" align="center"><b>PART B: Content of the Course</b></td></tr>
<tr><td colspan="5" align="center">Lectures (in hours per week): 2 Hrs. per week</td></tr>
<tr><td colspan="5" align="center">Total No. of Lectures (in hours): 60 Hrs.</td></tr>
<tr><td colspan="2"><b>Module</b></td><td colspan="2" align="center"><b>Topics</b></td><td><b>No. of Lectures</b></td></tr>
<tr><td colspan="2">I</td><td colspan="2">Introduction: Introduction: Definition, characteristics of IoT, IoT Conceptual framework, IoT Architectural view, Physical design of IoT, Logical design of IoT, Application of IoT, Arduino IDE, Setup(), loop(), delay, bound, serial monitor.</td><td>14</td></tr>
<tr><td colspan="2">II</td><td colspan="2">Machine-to-machine (M2M). SDN (software-defined networking) and NFV (network function virtualization) for IoT, data storage in IoT. IoT Cloud-Based Services.</td><td>14</td></tr>
<tr><td colspan="2">III</td><td colspan="2">Design Principles for Web Connectivity: Web Communication Protocols for connected devices, Message Communication Protocols for connected devices, SOAP, and REST. HTTP Restful Web Sockets. Internet. Connectivity Principles: Internet Connectivity, Internet-based communication, IP addressing in IoT, and Media Access control.</td><td>14</td></tr>
<tr><td colspan="2">IV</td><td colspan="2">Sensor Technology, Participatory Sensing, Industrial IOT and Automotive IOT, Actuator. Sensor data Communication Protocols, Radio Frequency Identification Technology, Wireless-Sensor Network Technology. IoT Design methodology: Specification Requirement, process, model, service, functional & operational view. IoT Privacy and security solutions, Raspberry Pi & Arduino devices. IoT Case studies: smart city streetlights control & monitoring, E-waste Management.</td><td>14</td></tr>
</tbody>
</table>

**Suggested Readings**

**Textbooks:**
- Rajkamal, Internet of Things—, Tata McGraw Hill publication.
- Hakima Chaouchi —The Internet of Things: Connecting Objects, Wiley publication.
- Francis Dacosta -Rethinking the Internet of things: A scalable Approach to connecting everything, 1st edition, Apress publications20l3.
- Donald Norris—The Internet of Things: Do-It-Yourself at Home Projects for Arduino, Raspberry Pi, and BeagleBone Black—, McGraw Hill publication.

**Reference books:**
- I . Philip Levis, -TinyOS Programming.
- D. Norris, —The Internet of Things: Do-it-Yourself Projects with Arduino, Raspberry Pi, and Beagle Bone Black, McGraw-Hill Education, New Delhi.
- Raj Karnal, —Internet of Things: Architecture and Desist, Tata McGraw Hill publication.
- Pajankarand A. Kakkar, —Raspberry Piby Example J, Pack Publishing Ltd, Birmingham, UK.
- S. Dooks published by II.P. Hindi Granth Academy, Bhopal

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- Suggestive digital platform web links.
- https://www.iotforall.com/introduction-rot-applications-in-education
- https://onlinecourses.swayam2.ac.in/arpl9_ap52/preview
- http://www.mphindigranthacademy.org.

| Part D-Assessment and Evaluation |
|---|
| Suggested Continuous Evaluation Methods: Maximum Marks: 100 |
| Continuous Comprehensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks |

| **Internal Assessment** Continuous Comprehensive Evaluation (CCE):40 | Class Test Assignment/Presentation | Total 40 |
|---|---|---|
| **External Assessment** University Exam Section: 60 Time : 03.00 | Section (A) : Objective Questions Section (B):  Short Questions Section  (C):   Long Questions | Total 60 |

<table>
<tr><td colspan="5" align="center"><b>PART' A:<br>1ntroduction</b></td></tr>
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| PART' A: 1ntroduction | | | | |
|---|---|---|---|---|
| Program: Diploma | Class: BCA | | **Year: III SEM** | **Session: 2023-24** |
| | Subject: Internet of Things(IOTs) Practical /Lab | | | |
| 1. | Course Code | | S2-BCAC 1 R | |
| 2. | Course Title | | Internet of Things (lOTs) lab | |
| 3. | Course Type(Core Course/ Elective/ Generic Elective/ Vocational | | Elective | |
| 4. | Pre-Requisite (if any) | | Open for all | |
| 5. | Connie 1.earning Outcomes (CLO) | | After completing this lab course, students will be able to: 1. Arduino/Raspberry Concept. 2. Knowledge of Digital Sensor. 3. Uses of DHT11 Sensors. 4. Knowledge of Bluetooth interface. | |
| 6. | Credit Value | | Practical — 2 Credits | |
| 7. | Total Marks | | Max. Marks: 40+60 | Min. Passing Marks: 35 |

| PART B: Content of the Course | |
|---|---|
| No. of Lab. Practical (in hours per week): 1 Hr. per week | |
| Total No. of Labs: 15 Hrs. | |
| **Suggestive List of Practical** | No. of Labs. |
| 1. To interface LLD/Buzzer with Arduino /Raspberry Pi and write a program to turn on LED after every 2 seconds. | |
| 2. To interface Push button/Digital sensor (IR/PDR) with Arduino/Raspberry Pi and write a program to turn on LED when push button is pressed or at sensor detection. | |
| 3. To interface DHT 11 sensor with Arduino/Raspberry Pi and write a program to print temperature and humidity readings. | |
| 4. To interface motor using relay with Arduino/Raspberry Pi and write a program to turn on motor when push button is pressed. | |
| 5. To interface OLED with Arduino/Raspberry Pi and write a program to temperature and humidity reading on it. | |
| 6. To interface blue tooth with Arduino/Raspberry Pi and write a program to send sensor data to smartphone using Bluetooth. | |
| 7. To interface Bluetooth with Arduino/Raspberry Pi and write a program to turn LED 'OFF when 1 "0'is received from smartphone using Bluetooth. | |
| 8. Write a program Arduino/Raspberry Pi to upload temperature and humidity data to thing speak cloud. | |
| 9. Write a program Arduino/Raspberry Pi to retrieve temperature and humidity data from thing speak cloud. | |
| 10. To install MySQL database on Raspberry Pi and perform basic SQL queries. | |

| **Suggested Readings** | | |
|---|---|---|

**Textbooks:**
- Rajkamal, Internet of Things—, Tata McGraw Hill publication.
- Hakima Chaouchi —The Internet of Things: Connecting Objects, Wiley publication.
- Francis Dacosta -Rethinking the Internet of things: A scalable Approach toconnectingeveiythingi,1st edition, Apress publications20l3.
- Donald Norris—The Internet of Things: Do-It-Yourself at Home Projects for Arduino, Raspberry Pi, and BeagleBone Black—, McGraw Hill publication.

**Reference books:**
- I . Philip Levis, -TinyOS Programming.
- D. Norris, —The Internet of Things: Do-it-Yourself Projects with Arduino, Raspberry Pi, and Beagle Bone Black, McGraw-Hill Education, New Delhi.
- Raj Karnal, —Internet of Things: Architecture and Desist, Tata McGraw Hill publication.
- Pajankarand A. Kakkar, —Raspberry PibyExampleJ, Packt Publishing Ltd, Birmingham, UK.
- S. Dooks published by II.P. Hindi Granth Academy, Bhopal

- Suggestive digital platform web links.
- https://www.iotforall.com/introduction-rot-applications-in-education
- https://onlinecourses.swayam2.ac.in/arpl9_ap52/preview
- http://www.mphindigranthacademy.org.

## Part D-Assessment and Evaluation

Suggested Continuous Evaluation Methods: Maximum Marks: 100

Continuous Comprehensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks

| **Internal Assessment** Continuous Comprehensive Evaluation (CCE):40 | Class Test Assignment/Presentation | Total 40 |
|---|---|---|
| **External Assessment** University Exam Section: 60 Time : 03.00 | Section (A) : Objective Questions Section (B):  Short Questions Section  (C):   Long Questions | Total 60 |

| PART A: Introduction | | | |
|---|---|---|---|
| PROGRAM: Degree | CLASS: BCA | SEMESTER: III | SESSION: 2023-24 |
| Subject: Computer Science | | | |

| | | |
|---|---|---|
| 1. | Course Code | S 2 – BCAA2G |
| 2. | Course Title | Artificial Intelligence |
| 3. | Course Type | Elective |
| 4. | Pre-Requisite (if any) | To study this course, a student must have basic knowledge of Artificial Intelligence. |
| 5. | Course Learning Outcomes(CO) | On completion of this course, learners will be able to:<br>CO1. Understand the basic structure, operation and characteristics of artificial Intelligence<br>CO2. Be able to design simple algorithms.<br>CO3. Understand the working on algorithms and games.<br>CO4. Know about deep learning, neural networks and Natural Language Processing.<br>CO5. Understand concept of supervised and unsupervised learning methods. |
| 6. | Credit Value | Theory 4 Credits Practical 2 Credits |
| 7. | Total Marks | Max. Marks : 100    Min. Passing Marks: 35 |

| PART B: Content of the Course | | |
|---|---|---|
| No. of Lectures (in hours per week): 3 Hrs. per week | | |
| Total No. of Lectures: 90 Hrs. | | |

| Module | Topics | No. of Lectures |
|---|---|---|
| I | Introduction: Overview of AI, Definition of AI, Aim of AI, Components of AI, Applications of AI, Understanding artificial neural networks, Supervised and unsupervised learning methods, deep learning, Applications of deep learning in image recognition, NLP, etc. | 14 |
| II | Knowledge & Reasoning: Knowledge representation issues, representation & mapping, approaches to knowledge representation, issues in knowledge representation. | 14 |

| III | Problem: problem characteristics, Types of Problem, Problem Solving Techniques: Special purpose methods and General Purpose methods, production system, Water-Jug Problem, Tic-Tac-Toe problem, Eight Puzzle Problem, Eight Queen problem. | 14 |
|---|---|---|
| IV | Prolog: AI Programming Languages, Introduction, history, objects, atoms, constants, variables, a deductive database, Relations and facts, clauses and instances, substitution of variables, goals, sub-goals, and predicates, rules, head and body, queries, recursive rules, structures and functions, list, tuples, operators, Family relations. | 14 |

Suggested Reading:

1. Artificial Intelligence Basics – Tom Taulli
2. A first course in  Artificial Intelligence – Deepak Khemani

| ST. ALOYSIUS' COLLEGE (AUTONOMOUS),JABALPUR | | | | |
|---|---|---|---|---|
| PART A: Introduction | | | | |
| Program: Diploma | Class: **BCA** | | Semester : **IVSEM** | Session: **2023-24** |
| Subject: **Computer** Applications | | | | |

| | | | |
|---|---|---|---|
| 1. | Course Code | BCA4 | |
| 2. | Course Title | **Programming using JAVA** | |
| 3. | Course Type (Core Course/Elective/Generic Elective/ Vocational | Major | |
| 4. | Pre-Requisite (if any) | To study this course, a student must have basic knowledge of Object-Oriented Programming. | |
| 5. | Course Learning Outcomes (CLO) | After **the completion of this course, a successful student** will be able **to do the following:**<br>• Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.<br>• Read and make elementary modifications to Java programs that solve real-world problems.<br>• Validate input in a Java program.<br>• Design and use basic applet for web page | |
| 6. | Credit Value | Theory — 4 Credits  Practical — 2 Credits | |
| 7. | Total Marks | Max. Marks : 40+60 | Min. Passing Marks: 35 |
| PART B: **Content of the Course** | | | |

No. of Lectures (in hours per week): 2 hrs. per week

Total No. of Lectures: 60 Hrs.

| Module | Topics | No. of Lectures |
|---|---|---|
| I | The Java Environment:<br>History and features of java, C++ VS java, JAVA Program Structure, Java Virtual Machine concepts, Primitive data types, variables and constants, operators, expression, statement-branching, looping and jumping, labeled statements. | 10 |
| II | Object Oriented Programming in Java:<br>Classes, objects and methods: defining a class, adding variables and methods,creating objects, constructor, Instances, field and methods initialization by constructors, Copy constructor. Arrays, String classes, Wrapper classes. | 14 |

| III | Inheritance: Inheritance basics, Super class, Sub-class, Method overloading, abstract classes. Interfaces: defining an interface, implementing & applying interfaces, variables in interfaces, extending interfaces. | 12 |
|---|---|---|
| IV | Multithreading and Exception Handling: Basic idea of multithreaded programming; The lifecycle of a thread, Creating thread with the thread class and runnable interface, Basic idea of exception handling: The try, catch and finally. | 12 |
| V | Applet programming-Local and Remote Applets, Applet Vs Application,creating and executing java applets, inserting applets in a web page, passing parameter to applets, Applet Tag, Getting Input from User. | 12 |

## PART C: Learning Resources

Textbooks, Reference
Books, Other Resources

Suggested Readings
- Java A Complete reference by Herbert Schildt, Mc Graw hill publication
- Thinking in Java (3rd edition) Bruce Eckel , Prentice Hall
- The Java Language Specification, Java SE 8 , Cay S. Horstmann, Gary Cornell, Prentice Hall
- Core Java an Integrated Approach ( Black Book), Dr. R. Nageswara Rao, Prentice Hall

Suggested Websites
    www.javatutorials.com
    www.javatpoint.com
    www.tutorialspoint.com

Part D-Assessment and Evaluation Suggested Continuous Evaluation Methods:

| Internal Assessment | Marks | External Assessment | Marks |
|---|---|---|---|
| Class Interaction /Quiz | | Viva Voce on Practical | |
| Attendance | | Practical Record File | |
| Assignments (Charts/ Model Seminar / Rural Service/ Technology Dissemination/ Report of Excursion/ Lab Visits/ Survey / Industrial | | Table work / Experiments | |
| TOTAL | 40 | | 60 |

| ST. ALOYSIUS' COLLEGE(AUTONOMOUS) JABALPUR | | | | |
|---|---|---|---|---|
| **PART A: Introduction** | | | | |
| Program: Diploma | Session: **2023-24** | Class: | Year: IV SEM | SESSION: 2023-24 |
| Subject: B.C.A. | | | | |
| Course Code | | | | |
| Course Title | | System Analysis and Engineering | | |
| Course Type (Core Course/ Discipline Specific Elective/ Elective/ Generic Elective /Vocational/) | | Minor | | |
| Pre-Requisite (if any) | | | | |
| Course learning outcome | | <ul><li>CO1. Gain in depth knowledge of basic understanding of system characteristics, system design, and its development processes.</li><li>CO2. Student will learn how a system is designed in a systematic and phased manner, starting from requirement analysis to system implementation and maintenance.</li><li>CO3. To gain the knowledge of how Analysis, Design, Implementation, Testing and Maintenance processes are conducted in a software project.</li><li>CO4 Ability to apply software engineering principles and techniques. To produce efficient, reliable, robust and cost-effective software solutions.</li><li>CO5. Students will be able to choose appropriate process model depending on the user requirements.</li><li>CO6. Students will be able perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance.</li></ul> | | |
| Credit Value | | Theory—6Credits | | |
| Total Marks | | Max. Marks: | Min. Passing Marks: | |
| **PART B: Content of the Course** | | | | |
| No. of Lectures (in hours per week): 3 **Hrs. per week** | | | | |
| Total No. of Lectures: **60 Hrs** | | | | |

| Module | Topics | No. of Lectures |
|---|---|---|
| I | System Analysis and Design - Overview: Systems Analysis, Systems Design, What is a System? , Constraints of a System, Properties of a System, Elements of a System, Types of Systems, Systems Models. | 14 |
| II | System Development Life Cycle: Phases of SDLC, Life Cycle of System Analysis and Design, Role of System Analyst, Attributes of a Systems Analyst. System Planning: Requirements Determination, Information Gathering Techniques. | 10 |
| III | Structured Analysis: Structured Analysis Tools, Data Flow Diagrams (DFD), Decision Trees, Decision Tables, Components of a Decision Table. System Design: Inputs and Outputs for System Design, Types of System Design. | 12 |
| IV | Software Characteristics, Components and Applications. Software Engineering - A Layered Technology. Software Process Models [Linear Sequential Model, Prototype and RAD Model]. Evolutionary Software Process Models [Waterfall Model, Incremental Model and Spiral Model]. | 12 |

| | | |
|---|---|---|
| V | S/W Quality Assurance: Quality Concepts, SQA activities, S/W Reviews, Formal Technical Reviews. S/W Testing Techniques: White and Black Box Testing, Basic Path Testing, Unit Testing, integration Testing, Validation Testing, System Testing. | 12 |

## PART C: Learning Resources

Textbooks, Reference Books, Other Resources

**Suggested Readings**

**Textbooks:**
- Systems Analysis and Design by Elias M Awad
- Alan Dennis' 5th Edition of Systems Analysis and Design
- An Integrated Approach To Software Engineering By Pankaj Jalote
- Software Engineering By R.S.Pressman,Edition V-

**Reference books:**
- Software Engineering {7th Edition) Addison- Wesley 2004 ,Ian Sommerville
- Software Engineering Hand book Auerbach publication, Jessica Keyes
- Software Engineering Principles and Practice 2"d edition Wiley
- System Analysis and Design (9th Edition) Kenneth E. Kendall & Julie Kendall

Suggestive digital platform web links.
- https://www.tutorialspoint.com/system_analysis_and_design/index.htm
- https://www.msuniv.ac.in/Download/Pdf/9cf334ee2d564a0
- https://www.tutorialspoint.com/software_engineering/software_engineering_tutorial.pdf
- http://fmcet.in/CSE/CS6403_uw.pdf

## Part E-Assessment and Evaluation

Suggested Continuous Evaluation Methods: Maximum Marks: 100

Continuous Comprehensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks

| **Internal Assessment** Continuous Comprehensive Evaluation (CCE):40 | Class Test Assignment/Presentation | Total 40 |
|---|---|---|
| **External Assessment** University Exam Section: 60 Time : 03.00 | Section (A) : Objective Questions Section (B): Short Questions Section (C): Long Questions | Total 70 |

| | | | | |
|---|---|---|---|---|
| | **ST. ALOYSIUS' COLLEGE(AUTONOMOUS) JABALPUR** | | | |
| | **PART A: Introduction** | | | |
| Program: Diploma | Session: **2023-24** | Class: BCA | IV Semester | SESSION: 2023-24 |
| Subject: **Computer Application (BCA)** | | | | |
| 1. Course Code | | | | |
| 2. Course Title | | **BLOCK CHAIN TECHNOLOGY** | | |
| 3. Course Type | | Elective | | |
| 4. Pre-Requisite (if any) | | Students must have basic Computer Knowledge | | |
| **5.** Course learning outcome | • To understand the concepts of blockchain technology<br>• To understand the consensus and hyper-ledger fabric in blockchain technology. State the basic concepts of blockchain<br>• Paraphrase the list of consensus and Demonstrate and interpret the working of Hyper ledger Fabric<br>• Implement SDK composer tool and explain the Digital identity for the government. | | | |
| 6. Credit Value | Theory—4 Credits | | | |
| **7.** Total Marks | Max. Marks: **40+60** | Min. Passing Marks: 35 | | |
| | **PART B: Content of the Course** | | | |
| | | | | |
| | Total No. of Lectures (in hours): 60 Hrs. | | | |

| Module | Topics | No. of Lectures |
|---|---|---|
| I | History: Digital Money to Distributed Ledgers -Design Primitives: Protocols, Security, Consensus, Permissions, Privacy-: Blockchain Architecture and Design-Basic crypto primitives: Hash, SignatureHash chain to Blockchain-Basic consensus mechanisms. | 14 |
| II | Requirements for the consensus protocols-Proof of Work (PoW)-Scalability aspects of Blockchain consensus protocols: Permissioned Block chains-Design goals-Consensus protocols for Permissioned Blockchains. | 14 |
| III | Decomposing the consensus process-Hyper ledger fabric components-Chain code Design and Implementation: Hyper ledger Fabric II:-Beyond Chain code: fabric SDK and Front End-Hyper ledger composer tool. | 14 |
| IV | Blockchain in Financial Software and Systems (FSS): -Settlements, -KYC, -Capital markets-Insurance Blockchain in trade/supply chain: Provenance of goods, visibility, trade/supply chain finance, invoice management/discounting. Blockchain Cryptography: Privacy and Security on Blockchain. | 14 |

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|---|
| **PART C: Learning Resources** |
| Textbooks, Reference Books, Other Resources |

**Suggested Readings**

**Textbooks:**
1. Mark Gates, ―Block chain: Ultimate guide to understanding block chain, bit coin, crypto currencies, smart contracts and the future of money‖, Wise Fox Publishing and Mark Gates 2017.
2. Salman Baset, Luc Desrosiers, Nitin Gaur, Petr Novotny, Anthony O'Dowd, Venkatraman Ramakrishna, ―Hands-On Block chain with Hyper ledger: Building decentralized applications with Hyperledger Fabric and Composer‖, 2018.
3. Bahga, Vijay Madisetti, ‒Block chain Applications: A Hands-On Approach‖, Arshdeep Bahga, Vijay Madisetti publishers 2017.

**Reference books:**
1. Andreas Antonopoulos, ‒Mastering Bitcoin: Unlocking Digital Crypto currencies‖, O'Reilly Media, Inc. 2014.
2. Melanie Swa, ‒Block chain ‖,O'Reilly Media 2014.

- NPTEL & MOOC courses titled blockchain technology
- blockgeeks.comguide/what-is-block-chain-technology
- https://nptel.ac.in/courses/106105184

| Part D-Assessment and Evaluation | | |
|---|---|---|
| Suggested Continuous Evaluation Methods: Maximum Marks: 100 | | |
| Continuous Comprehensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks | | |
| **Internal Assessment** Continuous Comprehensive Evaluation (CCE):40 | Class Test Assignment/Presentation | Total 40 |
| **External Assessment** University Exam Section: 60 Time : 03.00 | Section (A) : Objective Questions Section (B): Short Questions Section (C): Long Questions | Total 60 |

# ST. ALOYSIUS' COLLEGE (AUTONOMOUS) JABALPUR

## Part-A :Introduction

| Program: **Diploma** | | Class: **BCA** | Semester : IV | session: **2023-2024** |
|---|---|---|---|---|
| Subject : **Computer Applications** | | | | |
| 1. | Course Code | **S2-BCAD1G** | | |
| 2. | Course Title | **E-Commerce** | | |
| 3. | Course Type(Core Course/Elective/Generic Elective/Vocational/...) | **Generic Elective** | | |
| 4. | Pre-requisite(If any) | | | |
| 5. | Course Learning Outcomes (CLO) | On the completion of this course student will be able - <ul><li>To learn the fundamentals of E—Commerce and its process.</li><li>To understand the role of E- commerce in the present scenario along with the concepts of security and its applications.</li><li>To gain knowledge of e-commerce business needs and resources and match to technology considering human factors and budget constraints.</li><li>To apply knowledge of changing technology on traditional business models and strategy.</li><li>To have skills to communicate effectively and ethically using electronic communication.</li></ul> | | |
| 6. | Credit Value | Theory : 4 Credits | | |
| 7. | Total Marks | Max.Marks: 40 + 60 | | Min. Passing Marks:35 |

| Part-B :Contents | | |
|---|---|---|
| No. Of Lectures (in hours per week) **:2 Lectures per week** Total No. of Lectures **=60 Hrs.** | | |
| Module | Topics | No. of Lectures |
| I | *Introduction* Brief history of e-commerce ,Types , Advantages & Disadvantages of e-commerce, Elements of e-commerce, Principles of e-commerce, Messaging and Information distribution, Messaging and information distribution, Common service infrastructure, Architectural framework of Electronic Commerce, Web based E Commerce Architecture. | 10 |
| II | EDI to e-commerce: EDI - Origin , System approach and Communication approach, Benefits of EDI, EDI technology, EDI standards, EDI communications, EDI Implementation, EDI Agreements, EDI Security, EDI Mechanics, E-com with WWW/Internet. E-Government- Concepts, Applications of G2C, G2B, G2G, | 10 |
| III | WWW & Electronic Payment System: Applications — what is web , Why is the Web such a hit, The Web and E-Com, Concepts & Technology —Key concepts, Web Software development Tools. Electronic payment system — Overview , Electronic or digital cash , Electronic Checks , Online credit card based system, E-Retailing: Traditional retailing and e retailing, Benefits of e retailing, Models of e retailing, Features of e retailing. | 20 |
| IV | Security and Application Need of computer security, Specific intruder approaches, Security strategies, Cryptography, Public key encryption, Private key encryption, Digital signatures Advertising on the internet: Marketing. Electronic publishing issues, EP architecture, EP tools, Web page EP-Baseline issues, Application tools and publishing on the internet, Legal protections Intellectual Property Rights: Types of Intellectual Property protection, Governance. | 20 |

| | Part -C<br>Learning Resources | |
|---|---|---|
| | Suggested Digital Platforms, Web links<br>   1.  https://onlinecourses.nptel.ac.in/nocl9_inq54/preview<br>   2.  https://on1iiiecouises.swayain2.ac.in/cecl9_cm01/prev,,iew<br>   3.  https://www.couiseia.org/lecture/innovative-entrepreneur/e-commeice-the-internet-as-a-selling-platform-DYSNa<br>   4.  https://www.mooc-list.coin/tags/e-commerce-market<br>   5.  https://on1inecourses.swayam2.ac.in/nou21_cm14/preview<br>   6.  http://www.mphindigranthacademy.org/<br><br>Suggested Readings:<br>*1."Electronic Commerce" By Ravi Kalakota and Andrew B. Whinston.*<br>*2."Web Commerce Technologies Handbok" By Daniel Minoli & Emma Minoli*<br>*3."E-Commerce " By Dr.Varinder Bhatia*<br>*4. "Promise Of E-Governance" By M P Gupta*<br>*5.* Book published by M.P. Granth Academy , Bhopal<br>*6.* Elias. M. Awad, " Electronic Commerce", Prentice-Hall of India Pvt Ltd. | |

**Part D-Assessment and Evaluation**

**Suggested Continuous Evaluation Methods:**

Maximum Marks : 100

Continuous Comprehensive Evaluation (CCE) : 40marks University Exam(UE)
60marks Internal Assessment : Class Test                          Total 40
Continuous

| Comprehensive<br><br>tionEvaluation (CCE):40 |         Assignment/Presenta | |
|---|---|---|
| **External Assessment** :<br>University Exam Section: 60<br>Time : 03.00 Hours | Section(A) :Objective Questions   Total 60Section (B) : Short Questions | |
| | **Section (C)** : Long Questions | |

## ST. ALOYSIUS' COLLEGE(AUTONOMOUS) JABALPUR

### PART A: Introduction

| Program: Diploma | Session: **2023-24** | Class: BCA | IV SEM | SESSION: 2023-24 |
|---|---|---|---|---|
| Subject: **Computer Application (BCA)** | | | | |

| Course Code | |
|---|---|
| Course Title | **REACT JS** |
| Course Type | Elective |
| Pre-Requisite (if any) | Students must have knowledge of HTML, CSS and Java Script |
| Course learning outcome | <ul><li>Create React Components.</li><li>Perform some simple tests.</li><li>Think in React.</li><li>Add state and props to an application.</li><li>Add inverse data flow to an application.</li><li>Use some common React Hooks.</li><li>Use external services to provide data.</li><li>Set up a single page application.</li></ul> |
| Credit Value | Theory—3 Credits | |
| Total Marks | Max. Marks: **40+60** | Min. Passing Marks: 35 |

### PART B: Content of the Course

Lectures (in hours per week): 2 Hrs. per week

Total No. of Lectures (in hours): 60 Hrs.

| Module | Topics | No. of Lectures |
|---|---|---|
| I | Introduction to JavaScript, External javascript, Javascript Variable, global variable, control statements, Array, Date, Math, popup boxes, Document Object Model, Document Objects: getElementById, GetElementsByClassName(),getElementsByName(), getElementsByTagNames(), innerHTML property, innerText property, form validations, | 14 |
| II | Introduction to React: What is React, Why React, React version history, Anatomy of react project, Running the app, Debugging first react app.<br><br>Templating using JSX: Working with React. createElement, Expressions, Using logical operators, Specifying attributes, Specifying children, Fragments. | 14 |
| III | About Components: Significance of component architecture, Types of components, Functional, Class based, Pure, Component Composition Working with state and props: What is state and its significance, Read state and set state, Passing data to component using props, Validating props using propTypes, Supplying default values to props using default Props. | 14 |
| IV | Rendering lists: Using react key prop, Using map function to iterate on arrays to generate elements, Event handling in React: Understanding React event system, Understanding Synthetic event, Passing arguments to event handlers. Working with forms. | 14 |

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| **PART C: Learning Resources** |
| --- |
| Textbooks, Reference Books, Other Resources |

| **Suggested Readings** |
| --- |
| **Textbooks:** <br> • ReactJS by Example - Building Modern Web Applications with React <br> • React Js for Beginners A Comprehensive Beginner's Guide to ReactJS By Emma William · 2021 <br><br> **Reference books:** <br> • React and React Native A Complete Hands-on Guide to Modern Web and Mobile Development with React.js By Adam Boduch, Roy Derks · 2020 <br> • Quickstart Step-By-Step Guide to Learning React Javascript Library (React. Js, Reactjs, Learning React JS, React Javascript, React Programming) By Lionel Lopez · 2017 <br><br> • https://www.w3schools.com/REACT/DEFAULT.ASP <br> • https://legacy.reactjs.org/docs/getting-started.html |

| **Part D-Assessment and Evaluation** |
| --- |
| Suggested Continuous Evaluation Methods: Maximum Marks: 100 |
| Continuous Comprehensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks |

| | | |
| --- | --- | --- |
| **Internal Assessment** Continuous Comprehensive Evaluation (CCE):40 Marks | Class Test <br> Assignment/Presentation | Total 40 |
| **External Assessment** University Exam Section: 60 Marks | Section (A) : Objective Questions <br> Section (B): Short Questions <br> Section (C): Long Questions | Total 60 |

| ST. ALOYSIUS' COLLEGE(AUTONOMOUS) JABALPUR | | | | |
|---|---|---|---|---|
| **PART A: Introduction** | | | | |
| Program: Diploma | Session: **2023-24** | Class: BCA | IV SEM | SESSION: 2023-24 |
| Subject: **Computer Application (BCA)** | | | | |
| Course Code | | | | |
| Course Title | | **REACT JS** | | |
| Course Type | | Generic Elective | | |
| Pre-Requisite (if any) | | Students must have basic Computer Knowledge | | |
| Course learning outcome | • Able to work with react js <br> • Able to design and develop high class websites | | | |
| Credit Value | Practical— 1 Credits | | | |
| Total Marks | Max. Marks: **40+60** | Min. Passing Marks: 35 | | |
| **PART B: Content of the Course** | | | | |
| Lectures (in hours per week): 1 Hrs. per week | | | | |
| Total No. of Lectures (in hours): 60 Hrs. | | | | |

| Module | Topics | No. of Labs. |
|---|---|---|
| | a) Build Search filter in React <br><br> b) Creating a simple counter <br><br> c) Display a list <br><br> d) Build Accordion <br><br> e) Image Slider <br><br> f) Create a Checklist <br><br> g) Simple Login form <br><br> h) Multi-Page navigation using React Router | 30 |

| **PART C: Learning Resources** | | |
|---|---|---|
| Textbooks, Reference Books, Other Resources | | |

**Suggested Readings**

**Textbooks:**
• ReactJS by Example - Building Modern Web Applications with React
• React Js for Beginners A Comprehensive Beginner's Guide to ReactJS By Emma William • 2021
**Reference books:**
• https://contactmentor.com/react-js-practice-exercises-solution/?expand_article=1

• https://www.w3schools.com/php/
• https://www.learn-php.org/
• https://www.javatpoint.com/php-tutorial

| **Part D-Assessment and Evaluation** | | |
|---|---|---|
| Suggested Continuous Evaluation Methods: Maximum Marks: 100 | | |
| Continuous Comprehensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks | | |
| **Internal Assessment** Continuous Comprehensive Evaluation (CCE):40 Marks | • Hands-on Lab Practice: 10 Marks <br> • Viva: 10 Marks <br> • Lab Test from practical list: 10 Marks <br> • Assignments (Charts/ Model)/ Technology Dissemination/ Excursion/ Lab visit/ Industrial Training: 10 Marks | Total 40 |
| **External** | • Practical record file: 5 Marks | Total 60 |

| Assessment<br>University Exam<br>Section: 60 Marks | • Viva voce practical: 5 Marks<br>• Table works/ Exercise Assigned in practical exam: 40 Marks<br>• Reports of excursions Lab visits/ Industrial training/ Survey/ Collection/ Models: 10 Marks | |