Department of Science & Computer Science – BCA II Year

S. No.	Course Title	Course Type
1.	Data Communication and Computer Networks	Major
2.	Database Management System using PL/SQL	Major
3.	Internet Applications using JAVA Programming	Minor
4.	Internet of Things	Elective
5.	Web Designing	Vocational
6.	Digital Marketing	Vocational

Taranjeet
12/03/2025

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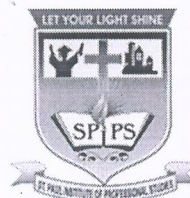
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Phone No. 0731-2499911, 49661355, 4961356

E-mail: info@spipsindore.ac.in, Website: www.spipsindore.com

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PART A: Introduction			
Program: **Diploma**	Class: **B.C.A.**	Year: **II Year**	Session: **2025-26**
Subject: Computer Applications			

1.	Course Code	**BC -201**
2.	Course Title	**Data Communication and Computer Networks**
3.	Course Type (Core/Elective/ Vocational)	**Core**
4.	Pre-Requisite (if any)	To study this course, a student must have the basic knowledge of Computers.
5.	Course Learning Outcomes(CLO)	- Demonstrate the Basic Concepts of Networking, Networking Principles, Routing Algorithms, IP Addressing and Working of Networking Devices. - Demonstrate the Significance, Purpose and application of Networking Protocols and Standards. - Describe, compare and contrast LAN, WAN, MAN, Intranet, Internet, AM, FM, PM and Various Switching Techniques. - Explain the working of Layers and apply the various protocols of OSI & TCP/IP model. - Analyze the Requirements for a Given Organizational Structure and Select the Most Appropriate Networking Architecture and Technologies. - Design the Network Diagram, Solve the Networking Problems of the Organizations with Consideration of Human and Environment. Install and Configure Networking Devices. - Understand and apply computer networking principles to address both national and international technological needs and challenges.
6.	Credit Value	6 Credits
7.	Total Marks	Max. Marks: **30+70** Min. Passing Marks:35

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| PART B: Content of the Course		
Total No. of Lectures (in hours per week): **6 Hours per week**		Total Lectures: **90 Hours**
Unit	Topics	No. of Lectures
I	Network goals and application, Network structure, Network services, Example of networks 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 (UTP, STP), Coaxial Cable, Fiberoptics: Selection and Evaluation factors. Line of Sight Transmission, Communication Satellites. Analog and Digital transmission. Transmission and switching, frequency division and time division multiplexing, STDM, 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 differences of LAN with emphasis on: Media, Topology, Speed of Transmission, Distance, Cost. Terminal Handling, Polling, Token passing, Contention. IEEE Standards: their need and developments.	20
IV	Open System: What is an Open System? Network Architectures, ISO-OSI Reference Model, Layers: Application, Presentation, Session, Transport, Network, Data Link & Physical. Physical Layer - Transmission, Bandwidth, signaling devices used, media type. Data Link Layer -: Addressing, Media Access Methods, Logical link Control, Basic algorithms/protocols.	20
V	Network Layer: Routing: Fewest-Hops routing, Type of Service routing, Updating Gateway routing information. Brief overview of Gateways, 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
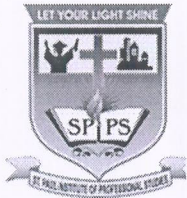
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PART C: Learning Resources
Textbooks, Reference Books, Other Resources
Suggested Readings: 1. Tannanbaum, A.S.: Computer Networks, Prentice Hall, 1985.processing, Prentice Hall,1983. 2. Black : Computer Networks : Protocols, standards and Interfaces, Prentice Hall International 1. Tannanbaum, A.S.: Computer Networks, Prentice Hall, 1985.processing, Prentice Hall,1983. 3. Fourauzan B., "Data Communications and Networking", 3rd edition, TataMcGrawHillPublications. **Reference Books:** 1. Corner   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://nptel.ac.in/courses/106/105/106105082/ http://cse.iitkgp.ac.in/~sandipc/courses/cs31006/slides/application layer.pdf https://onlinecourses.nptel.ac.in/noc22 ee61 /preview https://nptel.ac.in/course.html https://pll.harvard.edu/subject/computer-networking http://www.mphindigranthacademv.org/

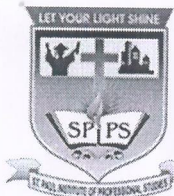| Part D- Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 100		
Continuous Comprehensive Evaluation (CCE): 30 marks University Exam (UE) :70 marks		
Internal Assessment:	Class Test	30
Continuous Comprehensive	Assignment/Presentation	
Evaluation (CCE):30	E-quiz	
External Assessment:	Section(A) : Six Very Short Questions	06 x 01 = 06
University Exam Section: 70	Section (B) : Five Short Questions	05 x 08 = 40
Time : 03.00 Hours	Section (C) : Two Long Questions	02 x 12 = 24 Total 70

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PART A- Introduction

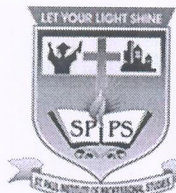| Program: Diploma		Class : BCA II	Session: 2025-26
1	Subject	Computer Applications	
2	Course Code	BC-202T	
3	Course Title	Database Management Systems Using PL/SQL	
4	Course Type	Core Course (Theory)	
5	Pre-Requisite	To study this course, a student must have the basic knowledge of Computers.	
6	Course Learning Outcomes	After completing this course student will be able to: • Explain the features of database management systems and relational database. • Design conceptual models of a database using er modelling for real life applications and construct queries in relational algebra. • Create and populate a RDBMS for a real-life application, with constraints and keys, using SQL. • Retrieve any type of information from a database by formulating complex queries in SQL. • Analyse the existing design of a database schema and apply concepts of normalization to design an optimal database.	
7	Credit value	Theory 4 + Practical 2	
8	Total Marks	Mix. Marks: 70+30 Min. Passing Marks: 35	

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PART B- Content of the Course

Total no. of Lectures (in hours per week): -4   **Total Lectures: -60**

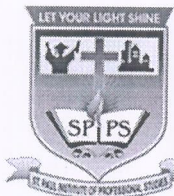| Unit	Topic	No. of Lectures
I	**Introduction to DBMS:** Why database? Characteristics of data in database, DBMS. What are database components, Types of Users, Advantages & Disadvantages, of DBMS? **Database Architecture and Modeling:** Conceptual, Physical and Logical database models, Role of DBA in Database design. **Entity Relationship (ER) Model:** Components of ER-model, ER modeling symbols, Type of attributes, entity and Relationship types. **Enhanced Entity Relationship (EER) Model:** An introduction, Superclass and subclass, Specialization, Generalization, Attribute inheritance, Categorization& Aggregation. *Keywords: DBMS, DBA, Entity Relationship (ER), EER, Superclass, Subclass, Specialization, Generalization, Categorization & Aggregation.*	12
II	**The Relational Data Model:** *Fundamental Concepts:* Relations, Null Values, Keys, Foreign Keys, Integrity Constraints - Entity Integrity & Relational Integrity. *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. *Transforming a Conceptual Model to a Relational Model:* Transforming Objects Sets and Attributes, Transforming Models without External Keys, Transforming Specialization and Generalization Object *Sets, Transforming Relationships:* One-One Relationships, One-Many Relationships, Many-Many Relationships; Transforming Aggregated Object Sets, Transforming Recursive Relationships. *Keywords: Keys, Normalization, BCNF, Aggregated Object Sets, Recursive Relationships.*	12
III	**Relational database implementation:** **Relational Algebra and Calculus** *Relational Algebra:* Union, Intersection, Difference, Product, Select, Project, Join - Natural, Theta & Outer Join, Divide, Assignment. *Relational Calculus:* Target list & Qualifying Statement, The Existential Quantifier, The Universal Quantifier. *Keywords: JOIN, Target list, Existential Quantifier, Universal Quantifier*	8
IV	**Relational database implementation (continued):** **Relational Implementation with SQL** *Relational Implementations:* An Overview. *Schema and Table Definition:* Schema definition, Data types & domains, Defining Tables, Column Definition.	16

		Data Manipulation: Simple Queries (SELECT, FROM, WHERE), Multiple-Table Queries, Subqueries, Correlated Subqueries, EXISTS and NOT EXISTS operators, Built-In Functions (SUM, AVG, COUNT, MAX, and MIN), GROUP BY and HAVING clause, Built-In Functions with Subqueries.	
		Database Change Operations: INSERT, UPDATE, DELETE. Using SQL with Data Processing Languages; View Definition, Restrictions on View Queries and Updates.	
		Keywords: Schema, SELECT, Data Manipulation, Database Change Operation, View.	
V		**Physical Database Systems** Introduction, Physical Access of the Database. *Physical Storage Media:* Secondary Storage, Physical Storage Blocks. *Disk Performance Factors:* Access Motion Time, Head Activation Time, Rotational Delay, Data Transfer Rate, Data Transfer Time. *Data Storage Formats on Disk:* Track Format, Record Format—Fixed-Length Records & Variable-Length Records, Input/output Management. *File Organizing and Addressing Methods:* Sequential File Organization, Indexed-Sequential File Organization, Direct File Organization, Hashing: Static Hash Functions and Dynamic Hash Functions. *Keywords: Disk Performance Factors, Sequential File Organization, Indexed-Sequential File Organization, Direct File Organization, Hashing*	12

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PART C- Learning Resources
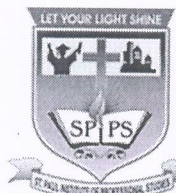
Textbooks/ Reference Books:

Text Books:

1. **1.** Gary W. Hansen & James V. Hansen, "Database Management and Design", 2n^{d}Ed., 2007, Prentice Hall of India Pvt Ltd.
2. Instructional Software Research & Development (ISRD) Group, Lucknow "Introduction to Database
    Management Systems", 2006, Ace Series, Tata McGraw Hill Publishing Company Limited, New Delhi

3. Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", 7th Edition, 2016, Pearson
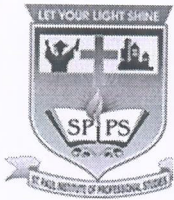
Reference Books:

1. Raghu Ramakrishnan & Johannes Gehrke, "Database Management Systems", 3^{14} Edition, 2014, McGraw Hill Education
2. C.J. Date,"An Introduction to Database System", 8th Edition, 2003, Pearson
3. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", 6th Edition, 2010, Tata McGraw Hill.
4. Books published by M.P. Hindi Granth Academy, Bhopal

Suggested Digital Platforms, Web Links:

http://en.wikipedia.org/wiki/Relational model
http://en.wikipedia.or2/wiki/Relational_algebra
cs.nyu.edu/courses/Fal 1 1 2/CSCI-GA.2433-00 1 /I ecture4.pdf
https://www.w3school si n/dbms/database-normal i zation/
https://beainnersbook.com/20 I 5/05/normalization-in-dbms/
hit ps://ecomputernotes.comandamental/wli at-is-a-database/functiona I-dependence
http://www.mphindigranthacademy.org/
Suggested equivalent online courses
NPTEL Course: *INTRODUCTION TO DATABASE SYSTEMSorDATABASE*

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Part D- Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 100		
Continuous Comprehensive Evaluation (CCE): 30 marks University Exam (UE) :70 marks		
Internal Assessment:	Class Test	30
Continuous Comprehensive	Assignment/Presentation	
Evaluation (CCE):30	E-quiz	
External Assessment:	Section(A) : Six Very Short Questions	06 x 01 = 06
University Exam Section: 70	Section (B) : Five Short Questions	05 x 08 = 40
Time : 03.00 Hours	Section (C) : Two Long Questions	02 x 12 = 24
Total 70

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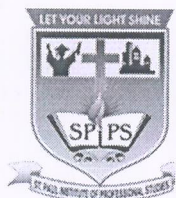Accredited by NAAC with 'A' Grade
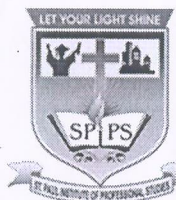Phone No. 0731-2499911, 49661355, 4961356
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Program: Diploma		Class : BCA II	Session: 2025-26
1	Subject	**Computer Applications**	
2	Course Code	**BC-202P**	
3	Course Title	**Database Management Systems Using PL/SQL LAB**	
4	Course Type	Core Course (Theory)	
5	Pre-Requisite	To study this course, a student must have the basic knowledge of Computers.	
6	Course Learning Outcomes	After completing this course student will be able to: • Explain the features of database management systems and relational database. • Design conceptual models of a database using er modelling for real life applications and construct queries in relational algebra. • Create and populate a RDBMS for a real-life application, with constraints and keys, using SQL. • Retrieve any type of information from a database by formulating complex queries in SQL. • Analyse the existing design of a database schema and apply concepts of normalization to design an optimal database.	
7	Credit value	2 credits (2-PR)	
8	Total Marks	Mix. Marks: 70+30 Min. Passing Marks: 33	

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PART B: **CONTENT OF THE COURSE**
Total No. of Lectures-Tutorials-Practical (in hours per week): **2**
Total Number of Practical: 30 **Hours**

Experiment-1

Aim: To draw ER Model and Relational Model for a given database. Show ER to Rational Model.

Experiment-2

Aim: Implementation Database
- Creation of Database with proper constraints (Pk, Fk, etc.)
- Insert into database using different types of insert statements
- Display

Experiment-3

Aim: Data Definition (schema) Modification
- Alter table: add column, remove column, add constraint, remove constraint
- Drop table
- Show schema of any table
- Applying different constraints check, not null, etc.

Experiment-4

Aim: 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, case update
- Delete, cascade delete (if possible)

Experiment-5

Aim: Advanced SQL Queries-1
- Group by, having clause, aggregate function
- Set operations like union, union all and use of order by clause
- Nested queries: in, not in, exists, not exists and any, all

Experiment-6

Aim: Advanced SQL Queries-2
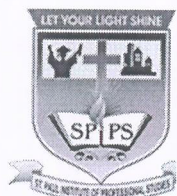- Join (Inner & Outer)
- Exists & Union

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PART C- Learning Resources

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Ramez Elmasri, Shamkant B. Navathe, "Fundamentals of Database Systems", 7th Edition, 2016, Pearson

Reference Books:

Raghu Ramakrishnan & Johannes Gehrke, "Database Management Systems", 3^{14} Edition, 2014, McGraw Hill Education

C.J. Date,"An Introduction to Database System", 8th Edition, 2003, Pearson

Abraham Silberschatz, Henry F. Korth, S. Sudharshan, "Database System Concepts", 6th Edition, 2010, Tata McGraw Hill.

Books published by M.P. Hindi Granth Academy, Bhopal

Suggested Digital Platforms, Web Links:

http://en.wikipedia.org/wiki/Relational model
http://en.wikipedia.or2/wiki/Relational_algebra
cs.nyu.edu/courses/Fal 1 1 2/CSCI-GA.2433-00 1 /I ecture4.pdf
https://www.w3school si n/dbms/database-normal i zation/
https://beainnersbook.com/20 I 5/05/normalization-in-dbms/
hit ps://ecomputernotes.comandamental/wli at-is-a-database/functiona I-dependence
http://www.mphindigranthacademy.org/
Suggested equivalent online courses
NPTEL Course: *INTRODUCTION TO DATABASE SYSTEMSorDATABASE*

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		Table work / Experiments		
TOTAL	**30**		**70**	

PART A- Introduction

Program: **Diploma**	Class: **BCA II Year**	Session: **2025-26**

1	Subject	**Computer Science**
2	Course Code	**BC-203T**
3	Course Title	**Internet Applications using JAVA Programming**
4	Course Type	Minor
5	Pre-Requisite	To study this course, a student must have basic knowledge of Object-Oriented Programming concepts
6	Course Learning Outcomes	After the completion of this course, a successful student will be able to do the following: • Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs. • Read and make elementary modifications to Java programs that solve real-world problems. • Validate input in a Java program. • Design and use basic applet for web page
7	Credit value	Theory 4 + Practical 2
8	Total Marks	Mix. Marks: 70+30 Min. Passing Marks: 35

PART B- Content of the Course

Total no. of Lectures (in hours per week): - 4 hours per week   **Total Lectures: - 60**

Unit	Topic	No. of Lectures
I	**The Java Environment:** History and features of java, C++ Vs java, OOPs concept, how java works, the concept of PATH and CLASS PATH, A simple program, its compilation and execution, JAVA Program Structure, Java Virtual Machine concepts, java platform overview. Primitive data types, variables and constants, operators, expression, statement-branching, looping and jumping, labeled statements.	10
II	**Object Oriented Programming in Java:** Classes, objects and methods: defining a class, adding variables and methods, creating objects, constructor, Instances, field and methods initialization by constructors, Copy constructor, memory allocation and garbage collection in java keywords, access methods Arrays, String and String buffer classes, Wrapper classes, using the JDK tools. **Inheritance:** Inheritance basics, Super class, Sub-class, Method overloading, abstract classes **Interfaces:** defining an interface, implementing & applying interfaces, variables in interfaces, extending interfaces.	12
III	**Multithreading and Exception Handling:** *Basic idea of multithreaded programming:* The lifecycle of a thread, Creating thread with the thread class and runnable interface, Thread synchronization, Thread scheduling, *Basic idea of exception handling:* The try, catch and throw, throws **The AWT:** The class hierarchy of window fundamentals; The basic user interface components Label, Button, Check Box, Radio Button, Choice menu, Text area, Scroll list, Scroll bar; Frame; Layout managers-flow layout, Grid layout, Border layout, Card layout.	14
IV	**The Java Event Handling Model:** Java's event delegation model ignoring the event, Self-contained events, Delegating events, The event class hierarchy, The relationship between interface, methods called, parameters and event source; Adapter classes, Event classes action Event, Adjustment Event, Container Event, Focus Event, Item Event, Event, Mouse Event, Text Event, Window Event. **Networking-basics,** networking classes and interfaces, using java.net package, TCP/IP and datagram programming.	12

V	**Input/ Output:** Exploring Java i.o, Directories, stream classes **The Byte Stream**: Input stream, output stream, file input stream, file output stream, print stream, Random access file, the character streams, Buffered reader, buffered writer, print writer, serialization. **JDBC**: JDBC-ODBC bridge, the connectivity model; The driver manager, Navigating the result set object contents, java.sql Package, The JDBC exception classes, Connecting to Remote database.	12
Keywords/ Tags	Class, Object, Method, Inheritance, Exception Handling, AWT, JDBC	

PART C- Learning Resources

Textbooks/ Reference Books:

1. Schildt java Complete Reference TMH
2. Das Rashmi kanta Core Java, IE, Vikas
3. Bansal Nitin, Ajit Kurnar, A Simplified approach to Java Programming , KALYANI
4. Naughton & Schildt "The Complete Reference Java 2", Tata McGraw Hill
5. Deitel "Java- How to Program:" Pearson Education, Asia
6. Horstmann& Cornell "Core Java 2" (Vol I & II) , Sun Microsystems
7. Lvan Bayross "Java 2.0" : BPB publications
8. Ivor Horton's "Beginning Java 2, JDK 5 Ed., Wiley India.
9. Book published by M.P. Granth Academy, Bhopal

Suggested Digital Platforms, Web Links:

1. https://www.youtube.com/watch?v=CFD9EFcNZTO

2. https://www.youtube.com/watch?v=7WhnYwoBY24

3. http://www.mphindigranthacademy.org/

Suggested equivalent online courses			
S.No.	Online Course	Duration	Plat
1	Programming in Java https://youtu.be/J dl fJy9OGY	12 weeks	NPTEL
2	The Complete Java Certification Course https://www.udemy.com/course/master-practical-java-development/	Self-paced	Udemy

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Part D- Assessment and Evaluation		
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PART A- Introduction

Program: **Diploma**		Class: **BCA II Year**	Session: **2025-26**
1	Subject	Computer Science	
2	Course Code	BC-203P	
3	Course Title	JAVA Programming Lab	
4	Course Type	Minor	
5	Pre-Requisite	To study this course, a student must have: • basic logical and analytical skills. • basic knowledge of Object-Oriented Programming concepts	
6	Course Learning Outcomes	**After the completion of this course, a successful student will be able to do the following** 1. Develop simple applications of java. 2. Implementation and use of conditional statement. 3. Learn to formulate iterative solutions and array processing algorithms for problems. 4. Learn to implement method Overloading and Overriding. 5. Implementation of inheritance and interface in java. 6. Develop a small applet program using AWT.	
7	Credit value	2	
8	Total Marks	Max. Marks: 100	Min. Passing Marks: 35

PART B- Content of the Course

Total no. of Lectures (in hours per week): - 2 hours per week   Total Lectures: - 30

Suggestive list of Practical	No. of Labs
1. Write a program to print numbers in words using Nested if and Switch Case.	30
2. Write a program called Pass-fail which prints "PASS" if the int variable "mark" is more than or equal to 50; or prints "FAIL" otherwise	
3. Write a program called Odd Even which prints "Odd Number" if the int variable "number" is odd, or "Even Number" otherwise.	
4. Write a Program to find sum & average of 10 no. using arrays.	
5. Write a program to display reverse of a digit no. using array.	
6. Write a program to display grade according to the marks obtained by the student.	
7. Find the factorial of number if number is given by user using command line argument.	
8. Write a program to print Fibonacci series.	
9. Write a program to display tables from 2 to 10.	
10. Write a program to take an input from user and check given number is prime or not.	
11. Write a program to implement method overriding.	
12. Write a program to convert given string into. Uppercase and lowercase and get the length of string Using array	
13. Write a program to overload volume method to find out volume of cube and cuboid.	
14. Write a program to design a class using abstract Methods and Classes.	
15. Write a program to implement multiple inheritance by using Interface.	
16. Write a program to create a package of your name and use that package in a class	
17. Write a program to implement parameterized constructor with default argument.	
18. Define an exception called "Marks out of Bound" exception that is thrown if the entered marks are greater than 100.	
19. Develop a simple real-life application to illustrate the use of multithreading.	
20. Design an app let that takes three numerical values as input from the user and then displays the largest of those three numbers on the screen	

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PART C- Learning Resources

Textbooks/ Reference Books:

1. Naughton & Schildt "The Complete Reference Java 2", Tata McGraw Hill
2. Java EE 6 for Beginners, Sharanam Shah, Vaishali Shah, Shroff Publishers and Distributors
3. Java EE Project using EJB 3, JPA and struts 2 for beginners, Shah, SPD
4. Java Programming A practical Approach, C Xavier, McGraw Hill
5. Java Server Faces A practical Approach for beginners, B M Harwani, Eastern Economy Edition (PHI).
6. Advanced Java Technology, Savaliya, Dreamtech.

Suggested Digital Platforms, Web Links:

1. https://www.youtube.com/watch?v=CFD9EFcNZTO

2. https://www.youtube.com/watch?v=7WhnYwoBY24

3. http://www.mphindigranthacademy.org/

Suggested equivalent online courses			
S. No.	Online Course	Duration	Platform
1	Programming in Java https://youtubendlfJy9OGY	12 weeks	NPTEL
2	The Complete Java Certification Course https://www.udemy.com/coursehnaster- java-development/practical-	Self-paced	Udemy

Part D- Assessment and Evaluation			
Suggested Continuous Evaluation Methods:			
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Class Interaction		Viva Voce on Practical	
Attendance		Practical Record File	
Assignments (Charts/ Model		Table work / Experiments	
TOTAL	30		70

PART A- Introduction

Program: Diploma		Class: BCA II	Session: 2025-26
1	Subject	Computer Science	
2	Course Code	EL-209T	
3	Course Title	**Internet of Things (IoT)**	
4	Course Type	Generic Elective	
5	Pre-Requisite	Student must have basic Computer Knowledge	
6	Course Learning Outcomes	**After completing this course student will be able to:** 1. To understand the basics of Internet of Things 2. To get an idea of some of the application areas where Internet of Things can be applied 3. To understand the middleware for Internet of Things and the concepts of Web of Things 4. To understand the concepts of Cloud of Things with emphasis on Mobile cloud Computing 5. To understand the IOT protocols	
7	Credit value	4 Theory + 2 Practical	
8	Total Marks	Mix. Marks: 70+30 Min. Passing Marks: 35	

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PART B- Content of the Course

Total no. of Lectures (in hours per week): - 4 Hrs. per week   Total Lectures: - 60 Hrs.

Unit	Topic	No. of Lectures
I	**Introduction**: Definition, Characteristics of IoT, IoT Conceptual framework, IoT Architectural view, Physical design of IoT, Logical design of IoT, Application of IoT	8
II	Machine-to-machine (M2M), SDN (software-defined networking) and NFV (network function virtualization) for IoT, data storage in IoT, IoT Cloud Based Services.	14
III	**Design Principles for Web Connectivity:** Web Communication Protocols for connected devices, Message Communication Protocols for connected devices, SOAP, REST, HTTP Restful and Web Sockets. **Internet Connectivity Principles**: Internet Connectivity, Internet based communication, IP addressing in IoT, Media Access control.	14
IV	**Sensors, Participatory Sensing, RFIDs, and Wireless Sensor Networks:** Sensor Technology, Participatory Sensing, Industrial IoT and Automotive IoT , Actuator, Sensor data Communication Protocols, Radio Frequency Identification Technology, Wireless Sensor Network Technology.	12
V	**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	12
Keywords/ Tags	Internet of Things, Communication Protocols, Sensors, Actuators, Arduino, Raspberry Pi.	

PART C- Learning Resources

Textbooks/ Reference Books:

1. Rajkamal, "Internet of Things", Tata McGraw Hill publication.
2. Hakima Chaouchi "The Internet of Things: Connecting Objects", Wiley publication.
3. Francis dacosta "Rethinking the Internet of things: A scalable Approach to connecting everything", 1st edition, A press publications2013.
4. Donald Norris "The Internet of Things: Do-It-Yourself at Home Projects for Arduino, Raspberry Pi and Beagle Bone Black", McGraw Hill publication.

Suggested Digital Platforms, Web Links:

1. Philip Levis, " TinyOS Programming"
2. D. Norris, "The Internet of Things: Do-It-Yourself Projects with Arduino, Raspberry Pi, and Beagle Bone Black", McGraw-Hill Education, New Delhi.
3. Raj Kamal, "Internet of Things: Architecture and Design", Tata McGraw Hill publication.
4. Pajankar and A. Kakkar, "Raspberry Pi by Example", Packt Publishing Ltd, Birmingham, UK.
5. Books published by M.P. Hindi Granth Academy, Bhopal
6. https://www.iotforall.com/introduction-iot-applications-in-education
7. https://onlinecourses.swayam2.ac.in/arp19_ap52/preview
8. http://www.mphindigranthacademy.org/

Part D- Assessment and Evaluation		
Suggested Continuous Evaluation Methods:		
Maximum Marks: 100		
Continuous Comprehensive Evaluation (CCE): 30 marks University Exam (UE):70 marks		
Internal Assessment:	Class Test	30
Continuous Comprehensive	Assignment/Presentation	
Evaluation (CCE):30	E-quiz	
External Assessment:	Section(A) : Six Very Short Questions	06 x 01 = 06
University Exam Section: 70	Section (B) : Five Short Questions	05 x 08 = 40
Time : 03.00 Hours	Section (C) : Two Long Questions	02 x 12 = 24 Total 70

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PART A- Introduction

Program: Diploma		Class: BCA	Session: 2025-26
1	Subject	Computer Science	
2	Course Code	**EL-209P**	
3	Course Title	**Internet of Things Practical (IoT)**	
4	Course Type	Elective	
5	Pre-Requisite	Student must have basic Computer Knowledge	
6	Course Learning Outcomes	**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.	
7	Credit value	2	
8	Total Marks	Mix. Marks: 100 Min. Passing Marks: 35	

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PART B- Content of the Course

No. of Lab. Practicals (in hours per week): 2 Hr. per week   Total Lectures: - 30 Hrs.

Suggestive List of Practicals	No. of Lectures
1. To interface LED/Buzzer with Arduino/Raspberry Pi and write a program to turn ON LED for 1 sec after every 2 seconds.	30
2. To interface Push button/Digital sensor (IR/LDR) with Arduino/Raspberry Pi and write a program to turn ON LED when push button is pressed or at sensor detection.	
3. To interface DHT11 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 print temperature and humidity readings on it.	
6. To interface Bluetooth with Arduino/Raspberry Pi and write a program to send sensor data to a smartphone using Bluetooth.	
7. To interface Bluetooth with Arduino/Raspberry Pi and write a program to turn LED ON/OFF when ' 17'0' is received from a smartphone using Bluetooth.	
8. Write a program on Arduino/Raspberry Pi to upload temperature and humidity data to the Thingspeak cloud.	
9. Write a program on Arduino/Raspberry Pi to retrieve temperature and humidity data from the Thingspeak cloud.	
10. To install MySQL database on Raspberry Pi and Perform basic SQL queries.	

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PART C- Learning Resources

Textbooks/ Reference Books:

1. Vijay Madisetti and Arshdeep Bahga, "Internet of things(A Hand-on-Approach)" 1st Edition ,Universal Press .
2. Hakima Chaouchi "The Internet of Things: Connecting Objects", Wiley publication.
3. Charless Bell "MySQL for the Internet of things", A press publications.
4. Francis dacosta "Rethinking the Internet of things: A scalable Approach to connecting everything", 1st edition, A press publications2013.
5. Book published by M.P. Granth Academy, Bhopal
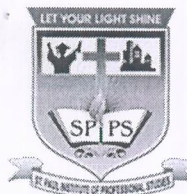
Suggested Digital Platforms, Web Links:

1. https://www.Inmiitac.in/Department/ECE/uploadedfiles/InternetofThingsLabmanual.pdf
2. https://www.corning.com/in-building-networks/worldwide/en/home/knowledge-center/practical-iot.html
3. https://onlinecourses.nptel.ac.in/noc21cs17/preview
4. http://www.mphindigranthacademy.org/

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		Table work / Experiments	
Total	30		70

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PART A- Introduction

Program: Diploma		Class: II Year	Session: 2025 - 2026
1	Subject	**Computer Science (Web Designing)**	
2	Course Code	**VO-202T/ VO-202P**	
3	Course Title	**Web Development using PHP and MySQL**	
4	Course Type	Vocational	
5	Pre-Requisite	• Basic Knowledge on HTML, CSS • Knowledge on Computer hardware & software.	
6	Course Learning Outcomes	**After completion of the course, students will be able to -** • Discover how the web works, and what makes websites work. • Implement simple and impressive design techniques, from basics to • they are advanced — to focus on goal-oriented and user-centric designs. • Use Server Side Scripting. • Implement the concept of data persistence. • Apply skills to program logic using PHP and handle data using MySQL. • Develop dynamic websites using PHP & MySQL.	
7	Expected Job Role / career opportunities	**Job Role -** Web Designer / Front End & Back End Developer/ Creative Ad Designer. **Job Description -** PHP developers write server-side web applications using Hypertext Preprocessor (PHP) scripting languages. They are tasked with developing and coding back-end components and connecting applications to other web services. PHI) developers also assist front-end developers to ensure their work integrates into the application. Career Opportunities - Typical employers of web developers and designers are - • Software companies • IT consultancies • Specialist web design companies • Large corporate organisations • Any organisation that uses computer systems • Self-employment/freelance work is often possible for individuals with appropriate experience. Vacancies are advertised online, by career services and by recruitment agencies.	
7	Credit value	**2 (Theory) + 2 (Practical) = 04**	
8	Total Marks	Mix. Marks: 70+30	Min. Passing Marks: 35

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PART B- Content of the Course

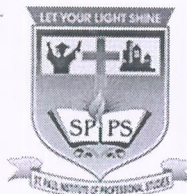**Total no. of Lectures (in hours per week): - 4 hours per week**   **Total Lectures: -60**

Unit	Topic	No. of Lectures
I	**BASICS OF PHP:** Introduction to PHP, PHP features, installation of XAMPP/WAMP, Benefits of using PHP MYSQL, Server Client Environment, Web Browser, Web Server Installation & Configuration Files. OOPs with PHP, language basics, syntax, comments, variables, constants and data types, expressions and operators, flow control statements, looping structures, Arrays Including HTML code in PHP, and Embedding PHP in web pages. **Functions:** Defining a function, Calling a function, variable scope, function parameters, return values, User Defined Function, System Defined Function, Parameterized Function, Date & Time Function, Hash Function, Mail Function, predefined functions.	20
II	**Strings:** Creating & accessing string, searching and replacing strings, encoding and escaping, comparing strings, formatting strings, and regular expressions. **Data & File Handling:** PHP Forms: $ GET, $ POST, $ REQUEST, $_REQUEST, $_SERVER, $GLOBALS, $_ENV, input/output controls, validation, Cookies and Sessions **File Handling:** File and directory, open, close, read, write, append, delete, uploading and downloading files. File exists, File Size, Rename. Reading and displaying all/selected tiles present in a directory	24
III	**MySQL an Overview:** Introduction, What is a Database, Understanding an RDBMS, Tables, Record & Fields, SQL Language. **Working with phpmyadmin:** Creating and using a database, Selecting a database, creating and dropping a table, loading data into a table, Retrieving information from a table, selecting all data, selecting particular rows, selecting particular columns, writing queries, sorting, date, calculations, working with NULL values, pattern matching, counting rows, using more than one tables, using table and column aliases.	10
IV	**MySQI, DATABASES IN PHP:** Introduction, connecting to a MySQL database, querying the database, Retrieving and displaying the results, modifying data and deleting data through the front end. Designing applications using PHP & MySQL.	6
Keywords/ Tags	PHP, WWW, Lists, Tables, MySQL, File Handling, Functions, PHP Forms, DATABASES	

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PART C- Learning Resources

Textbooks/ Reference Books:

1. Head First PHP & MySQL, Lynn Beighley & Michael Morrison, O'Reilly
2. PHP: A Beginner's Guide, Vikram Vaswani, McGraw-Hill Edition
3. Learning PUP, MySQL, JavaScript, & CSS: A Step-by-Step Guide to Creating Dynamic Websites, Robin Nixon, O'Reilly
4. PHP and MySQL Web Development, Luke Welling, Addison-Wesley
5. The Joy of PHP, Alan Forbes, BeakCheck LLC
6. Learning PHP, MySQL, JavaScript, & CSS: A Step-by-Step Guide to Creating Dynamic Websites, Robin Nixon, O'Reilly
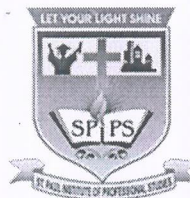
Suggested Digital Platforms, Web Links:

1. https://onlinecourses.swayam2.ac.in/aic20_sp32/preview
2. https://www.udemy.com/course/php-mysql-tutorial/
3. https://www.udemy.com/course/php-mysql-course-for-absolute-beginners/
4. https://www.simplilearn.com/learn-plhp-basics-free-course-skillup
5. https://www.coursera.org/learn/web-applications-php

PART-D : ASSESSMENT AND EVALUATION	
Suggested Continuous Evaluation Method: **Maximum Marks – 100 Theory + 100 Practical** **Continuous Comprehensive Evaluation (CCE): 30 Marks** **University Exam (UE) – 70 Marks** **VIVA VOCA (Practical)- 100 Marks**	
Internal Evaluation Continuous Comprehensive Evaluation (CCE): 30 Marks Common Class Test, Assignment/Presentations. E-Quiz, etc.	CCT Assignment/Presentation 30 Marks E-quiz
External Evaluation Term End Exam – 70 Marks Time – 2 Hours	Section A – Very Short Answer Questions – 4 Question x 2 Marks = 8 Marks Section B –Short Answer Questions – 4 Question x 8 Marks = 32 Marks Section C – Long Answer Questions – 2 Question x 15 Marks = 30 Marks

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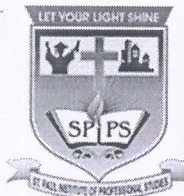Phone No. 0731-2499911, 49661355, 4961356
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PART A- Introduction

Program: Diploma		Class: II Year	Session: 2025- 2026
1	Subject	**Computer Science (Web Designing)**	
2	Course Code	**VO-202P**	
3	Course Title	**Web Development using PHP and MySQL**	
4	Course Type	Vocational	
5	Pre-Requisite	• Basic Knowledge on HTML, CSS • Knowledge on Computer hardware & software	
6	Course Learning Outcomes	**After completion of the course, students will be able to -** • Discover how the web works, and what makes websites work. • Implement simple and impressive design techniques, from basics to • they are advanced — to focus on goal-oriented and user-centric designs. • Use Server Side Scripting. • Implement the concept of data persistence. • Apply skills to program logic using PHP and handle data using MySQL. • Develop dynamic websites using PHP & MySQL.	
7	Credit value	2	
8	Total Marks	Mix. Marks: 30+70 Min. Passing Marks: 35	

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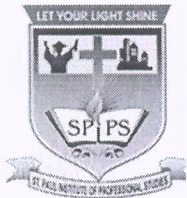
PART B- Content of the Course

Suggestive List of Practicals
Practical Lab will be conducted based on the theory Syllabus- 30 Hours

1. Create a simple HTML form accept the user name and display the name through a PHP echo statement.
2. Write a PHP script to demonstrate arithmetic operators, comparison operators, and logical operators.
3. Write a PHP Script to input marks, generate results and display grades.
4. Write a PHP Script for the addition of two 2x2 matrices.
5. Write a PHP script to obtain the factorial of a number using the function
6. Write a PHP script to demonstrate string, date and math functions.
7. Create a student registration form using a text box, check box, radio button, select, and submit button. And display user inserted value on the new PHP page.
8. Write two different PHP scripts to demonstrate passing variables through a URL
9. Write two different PHP scripts to demonstrate passing variables with sessions.
10. Write a PHP script to demonstrate passing variables with cookies.
11. Write a program to keep track of how many times a visitor has loaded the page.
12. Write a PHP script to demonstrate exceptional handling.
13. Write a PHP script to connect the MySQL server from your website.
14. Create EMP table with emp_no, emp_name, designation and salary. Write a program to read employee information from the EMP table and display all this information on a php page.
15. Create customer table in mysql with cust_no, cust_name, item_purchased, and mob no, insert 10 records into it.
16. Write a program to read customer information from the customer table and display all this information in table format on a PHP page.
17. Deigns a web form in PHP to input values for the customer record and insert the record in the customer table as a tuple.
18. Design an "update- web form to edit the name of the customer to "Bob" with cust_no 1
19. Design a "delete web form to delete records with cust no=3.
20. Create a dynamic website using PHP and MySQL.

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4. PHP and MySQL Web Development, Luke Welling, Addison-Wesley
5. The Joy of PHP, Alan Forbes, BeakCheck LLC
6. Learning PHP, MySQL, JavaScript, & CSS: A Step-by-Step Guide to Creating Dynamic Websites, Robin Nixon, O'Reilly

Suggested Digital Platforms, Web Links:

1. https://onlinecourses.swayam2.ac.in/aic20_sp32/preview
2. https://www.udemy.com/course/php-mysql-tutorial/
3. https://www.udemy.com/course/php-mysql-course-for-absolute-beginners/
4. https://www.simplilearn.com/learn-plhp-basics-free-course-skillup
5. https://www.coursera.org/learn/web-applications-php

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 visit)		Table work / Experiments	
TOTAL	30		70

Part A: Introduction

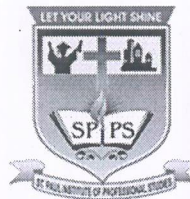|		
Programme : Diploma	Class :II Year	Session : 2025-26
Subject :	**Digital Marketing**	
Course Code	**V O - 2 0 1 T / V O - 2 0 1 P**	
Course Title :	**E-Commerce**	
Course Type:	Vocational	
Pre-requisite:		
Course Learning Outcomes	This paper aims to enhance skill for effective and contemporary applications of E-Commerce After completion of the course students will be able to: a) Describe the challenging needs of the society in the field of E-Commerce. b) Identify various activities and operations in the context of online transactions. c) Explain the steps in surfing of e-commerce websites. d) Describe various e-payment systems. e) Analyze security issues in E-Commerce. f) Develop and implement digital marketing strategies that effectively address both national and international market demands and trends.	
Expected Job Role /career opportunities	E-Business Consultant, Customer Relation Manager. Business Analyst, Supply Chain Manager, Project Manager, Database Administrator.	
Credit Value	**2 (Theory) + 2 (Practical) = 04**	
Total Marks	**Max. Marks —70+30** **Min. Passing Marks 35**	

Part B: Content of the course

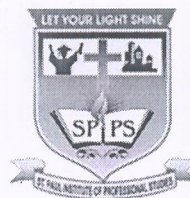| Unit	Topic	No. of lectures
Unit — 1	**Introduction to E- Commerce** Concepts and significance of E-commerce; Driving forces of E- commerce; E-commerce business models - Key elements of a business model and categories, Design and launch of E-commerce website -Decisions regarding Selection of hardware and software; Outsourcing Vs in-house development of a website; Functions of E-Commerce; Types of E-Commerce; E-Commerce Systems and Prerequisites, Scope of E-Commerce.	8
Unit — 2	**E-Commerce Activities and Operations** Various E-Commerce activities; Various manpower associated with e-commerce activities; Types of E-Commerce Providers and Vendors; Modes of operations associated with E-Commerce; E-commerce applications in various industries (banking, insurance, payment of utility bills and others), e-marketing, e-tailing, online services, e-auctions, online portal, online learning, e-publishing and e-entertainment, online shopping.	7
Unit- 3	**E-payment System and Application** E-payment Methods- Debit card, Credit card, Smart cards, E-Money, E-Wallets, payment gateways; Electronic fund transfer; Automated Clearing House. Automated Ledger Posting, Emerging modes and systems of E-payment (M-Paisa, PayPal and other digital currency), UPI Apps, Aadhar Enabled Payment Systems, BHIM App E-payments risks.	8
Unit- 4	Security and Legal Aspects of E-Commerce E- Commerce security –meaning and issue. Security threats in the E- Commerce environment – security intrusions and beaches, attacking methods like hacking, sniffing cyber-vandalism etc., Technology solution – encryption, security channels of communication, Protecting networks, servers and clients. Overview of Information Technology Act,2000-provisions related to secure electronic records. Digital signatures- Meaning, Registration Process, procedures and legal position Online banking- Meaning, concepts. Procedures, importance;	7

Practical	Total No. of lectures
1. Help others to learn the use of e-wallet, e- payment, digital signatures. Prepare a report on the skills used by them to help others learn. 2. Use the internet banking facility to buy a product from any online website. 3. Open internet banking account and operate it. 4. Create their own YouTube channel and post one video on awareness of cyber security and crime 5. Clicking various E-Commerce websites and how to register and login on it. 6. Use the internet banking facility to buy a product from any online website. 7. Register the complaint regarding various issues i.e. refund, return, defective product and delay in delivery.	30

Part C-Learning Resources
Text Books, Reference Books, Other resources
1. E-commerce- Tulsiram Kundala, K. maheshwari - Himalya publication Nagpur 2. E-commerce- Dr. Sandeep Srivastava, Er. Meera Goyal -SBPD - New Delhi 3. E-commerce - Avriti Tangri -VK Global Publications Pvt 4. E-commerce - B. Bhardwaj Dr. RS, Garg - Galgotia Publishing Company 5. Essential of E-Commerce —M.K.Mallick - Sanjay Sahity Bhavan Agra 6 Business on the Net: An Introduction to the whats and hows of E-commerce. Noida, Uttar Pradesh: Agarwala, K. N., Lal, A., & Agarwala, D Macmillan Publishers India Limited. 7. *Electronic commerce- A Manager's Guide to E- Business.*- Diwan, P., & Sharma, S- Vanity Books International Delhi .
Suggested equivalent online courses: e-reading: 1.https://www.iare.ac.in/sites/default/files/lecture_notes/tARLECommerce_Lecture_Notes.pdf2. https://oms.bdu.ac.in/ec/admin/contents/387 2020051801071611.pdf 1^{3}16MCE4A
3.https://www.gasckovilpatti.com/studymaterial/commerce/11%20MCOM%20E%2000MMERCE%20p KCM33.pdf
5. https://backup.pondiuni.edu.in/storage/dde/dde ug pg books/E-%20Commerce.pdf
6. https://www.tutorialspoint.com/e commerce/e commerce tutorial.pd

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PART-D: ASSESSMENT AND EVALUATION	
Suggested Continuous Evaluation Method: Maximum Marks – 100 Continuous Comprehensive Evaluation (CCE): 30 Marks Term End Examination (TEE) – 70 Marks	
Internal Evaluation Continuous Comprehensive Evaluation (CCE): 30 Marks Common Class Test, Assignment/Presentations, E-Quiz, etc.	CCT Assignment/Presentation 30 Marks E-quiz
External Evaluation Term End Exam – 70 Marks Time – 2 Hours	Section A – Very Short Answer Questions – 4 Question x 2 Marks = 8 Marks Section B –Short Answer Questions – 4 Question x 8 Marks = 32 Marks Section C – Long Answer Questions – 2 Question x 15 Marks = 30 Marks

BCA II Year

Type	Subject Group	Course Code	Course Title	Credit	Total Credit Hours	Lecture Hours Per Week	Max. Marks External	Max. Marks Internal	Total marks
Major	Computer Applications	BC-201	Data Communication and Computer Networks	6	90	6	70	30	100
Major	Computer Applications	BC-202T	Database Management System using PL/SQL	4	60	4	70	30	100
Major	Computer Applications	BC-202P	Database Management System using PL/SQL	2	30	2	100		100
Minor	Computer Applications	BC-203T	Internet Applications using JAVA Programming	4	60	4	70	30	100
Minor	Computer Applications	BC-203P	JAVA Programming Lab	2	30	2	100		100
Elective	Business Economics	EL-202	Indian Economy	6	90	6	70	30	100
Elective	Business Economics	EL-204	Entrepreneurship and Family Business	6	90	6	70	30	100
Elective	NCC	EL-205T	NCC Part II	4	60	4	70	30	100
Elective	NCC	EL-205P	NCC Training Part II	2	30	2	100		100
Elective	Physical Education	EL-206T	Physical Education for Healthful Living	4	60	4	70	30	100
Elective	Physical Education	EL-206P	Physical Education for Healthful Living	2	30	2	100		100
Elective	English Literature	EL-208T	Mass media and Communication Skills	4	60	4	70	30	100
Elective	English Literature	EL-208P	Experiments with Mass Media and Communication	2	30	2	100		100
Elective	Computer Applications	EL-209T	Internet of Things	4	60	4	70	30	100
Elective	Computer Applications	EL-209P	Internet of Things Practical	2	30	2	100		100

Category	Subject	Code	Course						
Vocational	Digital Marketing	VO-201T	E-Commerce	2	30	2	70	30	100
	Digital Marketing	VO-201P	E-Commerce	2	30	2	100		100
	Web Designing	VO-202T	Web Development using PHP and MySQL	2	30	2	70	30	100
	Web Designing	VO-202P	Web Development using PHP and MySQL	2	30	2	100		100
	Personality Development	VO-203T	Personality Development	2	30	2	70	30	100
	Personality Development	VO-203P	Personality Development	2	30	2	100		100
	Retail Management	VO-204T	Supply Chain and Retail Management	2	30	2	70	30	100
	Retail Management	VO-204P	Supply Chain and Retail Management	2	30	2	100		100
	Export and Import management	VO-205T	Foreign Trade -Procedure and Documentation	2	30	2	70	30	100
	Export and Import management	VO-205P	Foreign Trade -Procedure and Documentation	2	30	2	100		100
	E-Acc. & Taxation with GST	VO-206T	E-Filing of Tax Returns	2	30	2	70	30	100
	E-Acc. & Taxation with GST	VO-206P	E-Filing of Tax Returns	2	30	2	100		100
	Accounting and Tally	VO-207T	Computerized Accounting	2	30	2	70	30	100
	Accounting and Tally	VO-207P	Computerized Accounting	2	30	2	100		100
	Financial Services and Insurance	VO-208T	Personal Finance and Planning	2	30	2	70	30	100
	Financial Services and Insurance	VO-208P	Personal Finance and Planning	2	30	2	100		100
	Salesmanship	VO-210T	Customer Relationship Management	2	30	2	70	30	100
	Salesmanship	VO-210P	Customer Relationship Management	2	30	2	100		100
Foundation	English	FC-201	English language and Foundation	2	30	2	50		50
	Hindi	FC-202	Bhasha aur Sanskriti	2	30	2	50		50
	Entrepreneurship Development	FC-203	Entrepreneurship Development	2	30	2	50		50
	Women Empowerment	FC-204	Women Empowerment	2	30	2	50		50
Project	Field Work	PR-201 A	Internship	4	60		100		100
	Field Work	PR-201 B	Apprenticeship	4	60		100		100
	Field Work	PR-201 C	Communality Engagement	4	60		100		100
	Project Work	PR-201 D	Project	4	60		100		100