VIKRAM UNIVERSITY, UJJAIN MP

(Session -2022-2023 onwards)

BCA (Hon's) FOUR YEARS (EIGHT SEMESTERS), CBCS SCHEME (NEP)

S.No.	Paper code	Course Component and Name of Course	Credits			Marks		Total
			T	P	Total	Max Marks CCE Internals	Max Marks Theory Externals	
1.	BCAH 301 Major-1	Data Structure using C++	2	0	2	30	45	100
	BCAH P	Data Structure using C++	0	1	1	10	15	
2.	BCAH 302 Major-2	Data Communication and Computer Network	3	0		40	60	100
3.	BCAH 303 Minor-1	System Analysis and Design	3	0		40	60	100
4.	BCAH-304 Generic Elective	E-Commerce	3	0		40	60	100
5.	Ability Enhancement Course	Hindi	2	0		20	30	100
		English	2	0		20	30	
6.	Vocational/Skill Enhancement-Course from any faculty/Mooc Course	Web Development using PHP	4	0		40	60	100
Total Credits and marks					20			600

PART A: Introduction				
Program: Diploma		Class: III SEM	Year: II Year	Session: 2022-23
Subject: Computer Application				
1.	Course Code	**BCAH 301**		
2.	Course Title	**Data Structures Using C++**		
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Core course**		
4.	Pre-Requisite (if any)	To study this course, a student must have the basic knowledge of C and C++		
5.	Course Learning Outcomes(CLO)	• Outline basic object-oriented design concepts. i.e., Inheritance, Polymorphism, Dynamic Method Binding etc. • Understand and implement the various data structures such as Lists, Queues. • Understand and implement various hierarchical data structures: Binary search trees, Graphs etc. • Analyses sorting and searching algorithms, and explain their relationship to data structures. • Analyses time and space complexity of algorithms. • Choose and implement appropriate data structures to solve an application problem.		
6.	Credit Value	6 credits		
7.	Total Marks	Max. Marks : 15+35	Min. Passing Marks: 17	

PART B: Content of the Course		
Total No. of Lectures (in hours per week): 01 Hour per day		
Total Lectures:60 Hours		
Unit	Topics	No. of Lectures
I	**Stacks and Queues:** Introduction to Data Structures, Common operations on data structures, Types of data structures, ADT Stack and its implementation in C++: various operations on stack, various polish notations-infix, prefix, postfix, conversion from one to another-using stack; evaluation of postfix expressions. Contiguous implementation of queue: Linear queue, its drawback; circular queue; various operations on queue; Evaluation of postfix expressions, ADT Queue and its implementation in C++.	12
II	**Searching algorithms:** Linked Lists: Defining & implementing linked lists with creation, insertion and deletion operations in C++, Sequential search & Binary search algorithms, Implementation in C++.	12
III	**Sorting Algorithms:** Implementation and Algorithm Analysis of Insertion sort, Selection sort, Merge Sort, Quick Sort and Bubble sort.	12

IV	**Trees:** Basic Terminology, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary Trees, Traversal of binary trees: - In order, Preorder &Post order, Application of Binary tree, Binary Search Tree, Heap Tree, AVL Trees.	12
V	**Graphs:** Introduction to graphs, Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, Graph Traversal- Depth first & Breadth first search. **Hashing and Indexing:** Hash Table, Collision resolution Techniques, index techniques, cylinder-surface indexing, tree indexing-B-trees, trie indexing.	12

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

1. Date Structure: By lipschuists (Schaum's Outline Series Mcgraw Hill Publication)
2. Introduction to Data Structures and Algorithms with C ++, GLENN W.ROWE, Prentice Hall India, 2003
3. Data Structures and Algorithms, Alfred V. Aho, John E. Hopecraft, Jaffrey D. Ullman, Pearson education

Suggested Web Link:

1. **https://nptel.ac.in/courses/106102064**
2. **https://nptel.ac.in/courses/106106133**
3. **https://www.tutorialspoint.com/data_structures_algorithms/data_structures_algorithms_pdf_version.htm**

Part D: Assessment and Evaluation

Suggested Continuous Evaluation Methods:
Maximum Marks: **75**
Continuous Comprehensive Evaluation (CCE): **30** Marks
University Exam (UE): **45** Marks

Internal Assessment: Continuous Comprehensive Evaluation (CCE)	Class Test Assignment/Presentation	15 15 **Total Marks: 30**
External Assessment: University Exam (UE) Time: 03.00 Hours	Section (A):Short Answer type questions Section (B): Long Answer Type Questions	03 × 05 = 15 06 × 05 = 30 **Total Marks: 45**

PART A: Introduction

Program: **Diploma**	Class: **B.C.A.**	Year: **II Year (III Sem)**	Session: **2022-23**

Subject: **Computer Applications**

1.	Course Code	BCAHP
2.	Course Title	**Data Structure using C++**
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Core Course**
4.	Pre-Requisite (if any)	To study this course, a student must have the basic knowledge of C and C++
5.	Course Learning Outcomes(CLO)	**After the completion of this course, a successful student will be able to do the following**: • Outline basic object-oriented design concepts. i.e., Inheritance, Polymorphism, Dynamic Method Binding etc. • Understand and implement the various data structures such as Lists, Queues. • Understand and implement various hierarchical data structures: Binary search trees, Graphs etc. • Analyses sorting and searching algorithms, and explain their relationship to data structures. • Analyses time and space complexity of algorithms. • Choose and implement appropriate data structures to solve an application problem.
6.	Credit Value	**Practical – 2 Credits**
7.	Total Marks	Max. Marks : **10+15** / Min. Passing Marks: 10

PART B: Content of the Course

No. of Lab Practicals (in hours per week): **2 hours per week**

Total No. of Lab.: **60 Hrs.**

	Suggestive list of Practicals	**No. of Labs.**
	Given the problem statement, students are required to formulate problem, develop flowchart/algorithm, write code in C, execute and test it. Students should be given assignments on following : 1. Write a C++ Program to produce the sum of Array elements. 2. Write a C++ Program for addition of two array. 3. Write a C++ Program for Push and pop operation on stack using array. 4. Write a C++ Program for Insertion and deletion operation on queue using array. 5. Write a C++ Program for Insertion and deletion operation on circular queue using array. 6. Write a C++ Program for Insertion sort. 7. Write a C++ Program for Bubble sort. 8. Write a C++ Program for Quick sort 9. Write a C++ Program for selection sort. 10. Write a C++ Program for Linear search. 11. Write a C++ Program for Binary search. 12. Write a C++ Program for Linked List creation, insertion and	60

	deletion.	

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings

- J. R. Hanly and E. B. Koffman, “Problem Solving and Program Design in C”, Pearson, 2015
- E. Balguruswamy, "C++ ", TMH Publication ISBN O-07-462038-X
- Herbert Shildt, "C++ The Complete Reference "TMH Publication ISBN 0-07-463880-7

Reference Books:

- R. Lafore, 'Object Oriented Programming C++"
- N. Dale and C. Weems, “Programming and problem solving with C++: brief edition”, Jones & Bartlett Learning.
- Adam Drozdek, "Data Structures and algorithm in C++", Third Edition, Cengage Learning.
- SartajSahani, “Data Structures, Algorithms and Applications with C++”, McGraw Hill.
- Robert L. Kruse, "Data Structures and Program Design in C++", Pearson.
- D.S. Malik, “Data Structure using C++”, Second edition, Cengage Learning.
- M. A. Weiss, “Data structures and Algorithm Analysis in C”, 2nd edition, Pearson.
- Lipschutz,“Schaum’s outline series Data structures”, Tata McGraw-Hill

Suggestive digital platform web links

https://www.youtube.com/watch?v=BClS40yzssA
https://www.youtube.com/watch?v=vLnPwxZdW4Y&vl=en
https://www.youtube.com/watch?v=Umm1ZQ5ltZw

Suggested equivalent online courses

PART D: Assessment and Evaluation

Internal Assessment : Continuous Comprehensive Evaluation (CCE) : **10Marks**		**External Assessment**: University Exam (UE) : **15 Marks** Time : **02.00 Hours**	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Hands-on Lab Practice	2 Marks	Practical record file	5 Marks
Viva	3 Marks	Viva voce practical	5 Marks
Lab Test from practical list	2 Marks	Table works/ Exercise Assigned (02) in practical exam	2 Marks
Assignments (Charts/ Model)/ Technology Dissemination/ Excursion/ Lab visit/ Industrial Training	3 Marks	Reports of excursion/ Lab visits/ Industrial training/ Survey/ Collection/ Models	3 Marks
Total ***Excursion/ Lab visits/ Industrial Training is compulsory***	**10 Marks**	**Total**	**15 Marks**

PART A: Introduction				
Program: Diploma		Class: III Sem	Year: II Year	Session: 2022-23
Subject: Computer Application				
1.	Course Code	**BCAH 302**		
2.	Course Title	**Data Communication and Computer Network**		
3.	Course Type (Core Course/Elective/Generic 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 and Solve the Networking Problems of the Organizations with Consideration of Human and Environment. • Install and Configure the Networking Devices.		
6.	Credit Value	6 Credits		
7.	Total Marks	Max.Marks : 100	Min. Passing Marks:40	

PART B: Content of the Course		
Total No. of Lectures(in hours per week): 1 Hour per Day		
Total Lectures: 6 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.	18
	Theoretical Basis for Data communication, Transmission media, Twisted pair (UTP, STP), Coaxial Cable, Fiberoptics: Selection and Evaluation	

II	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,	18
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.	18
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.	18
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.	18

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, standords and Interfaces, Prentice Hall International 1. Tannanbaum, A.S.: Computer Networks, Prentice Hall, 1985.processing, Prentice Hall,1983.

Suggested Web Link:

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

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:	Class Test	20
Continuous	Assignment/Presentation	20
Comprehensive		**Total Marks: 40**
Evaluation (CCE)		

External Assessment: University Exam (UE) Time: 03.00 Hours	Section (A): Five Short Questions Section (B): Five Long Questions	$04 \times 05 = 20$ $08 \times 05 = 40$ **Total Marks: 60**

PART A: Introduction				
Program: Diploma		Class: III SEM	Year: II Year	Session: 2022-23
Subject: Computer Application				
1.	Course Code	**BCAH-303**		
2.	Course Title	**System Analysis and Design**		
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Minor**		
4.	Pre-Requisite (if any)	Students must have the basic knowledge of Computer basics.		
5.	Course Learning Outcomes(CLO)	• Understand the application of software engineering approaches in software development. • Ability to plan and estimate projects. • Analyze and design software. • Produce quality software using testing and quality assurance mechanisms. • Understand the importance of software maintenance.		
6.	Credit Value	6 credits		
7.	Total Marks	Max. Marks : 100	Min. Passing Marks: 40	

PART B: Content of the Course		
Total No. of Lectures (in hours per week): 01 Hour per day		
Total Lectures:90 Hours		
Unit	Topics	No. of Lectures
I	Overview of system analysis and design, system development life cycle, project selection, feasibility analysis, design, implementation, testing and evaluation.	18
II	Feasibility study- Technical and economical feasibility, cost and benefit analysis	18
III	System requirement specification and analysis: Fact finding techniques, Data flow diagrams, Data dictionaries, process organisation and interactions, decision analysis, decisin trees and tables.	18
IV	Detailed design- Modularisation, module specification, file design, system development involving data bases. System Control and Quality Assurance- reliability and maintenance.	18
V	Software design and documentation tools, top-down ,bottom-up and variants. Units and integration testing, testing practices and plans. System controls , Audit trails.	18

PART C: Learning Resources
Textbooks, Reference Books, Other Resources
Suggested Readings: 1. James,A.S.: Analysis of design of Information systems,Mcgraw Hill 1986. 2. Ludeberg, M., Golkuhl, G. and hilsson,A. : Information systems development, Asystematis approach, Prentice Hall international 1981. 3. lesson,M.: System analysis and design, science research associates,1985 4. Sempriv,P.C.: System analysis-Definition Process and Design,1982 5. Richard,D.: System analysis design,Irwin Inc.1979. 6. Awad,E. Homewood : System analysis and design,Awad,Irwin 1979.
Suggested Web Link: **https://nptel.ac.in/courses/106108102** **https://nptel.ac.in/courses/107106009** **https://www.tutorialspoint.com/system_analysis_and_design/index.htm**

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)	Class Test Assignment/Presentation	20 20 **Total Marks: 40**
External Assessment: University Exam (UE) Time: 03.00 Hours	Section (A):Short Answer type questions Section (B): Long Answer Type Questions	04 × 05 = 20 08 × 05 = 40 **Total Marks: 60**

PART A: Introduction			
Program: Diploma	Class: III SEM	Year: II Year	Session: 2022-23
Subject: Computer Application			

1.	Course Code	**BCAH 304**	
2.	Course Title	**E-Commerce**	
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Generic Elective**	
4.	Pre-Requisite (if any)	Students must have the basic knowledge of Computer basics.	
5.	Course Learning Outcomes(CLO)	On the completion of this course student will be able - • To learn the fundamentals of E Commerce and its process. • To understand the role of E- commerce in the present scenario along with the concepts of security and its applications. • To gain knowledge of e-commerce business needs and resources and match to technology considering human factors and budget constraints. • To apply knowledge of changing technology on traditional business models and strategy. • To have skills to communicate effectively and ethically using electronic communication.	
6.	Credit Value	6 credits	
7.	Total Marks	Max. Marks : 100	Min. Passing Marks: 40

PART B: Content of the Course		
Total No. of Lectures (in hours per week): 01 Hour per day		
Total Lectures:90 Hours		
Unit	Topics	No. of Lectures
I	Introduction Brief history of e-commerce ,Types , Advantages & Disadvantages of e-commerce , Elements of e-commerce , Principles ofe-commerece , Messaging and Information distribution , Messaging and information distribution , Common service infrastructure , other key support layers	12
II	EDI to e-commerce: EDI - Origin , System approach and communication approach , Migration to open EDI-Approach , Benefits , Mechanics , E-com with WWW/Internet. E-Government- Concepts, Applications of G2C, G2B, G2G	12
III	Electronic communication PC and networking , Network topologies and communication media , E-mail , OSI and TCP/IP Models , LAN, WAN, MAN Internetworking — Bridges and gateways , Internet Vs Online services, Open vs. Closed Architecture , Controlled contained Vs Uncontrolled	12

	contained , Metered Pricing Vs Flat pricing , Innovation Vs Control.	
IV	Electronic communication PC and networking , Network topologies and communication media , E-mail , OSI and TCP/IP Models , LAN, WAN, MAN Internetworking — Bridges and gateways , Internet Vs Online services, Open vs. Closed Architecture , Controlled contained Vs Uncontrolled contained , Metered Pricing Vs Flat pricing , Innovation Vs Control.	12
V	Securitv 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, Creating a website. Electronic publishing issues, EP architecture, EP tools, Web page EP-Baseline issues, Application tools and publishing on the internet.	12

PART C: Learning Resources
Textbooks, Reference Books, Other Resources
Suggested Readings: *1.*"Electronic Commerce" By Ravi Kalakota and Andrew B.Whinston. *2.*"Web Commerce Technologies Handbok"By Daniel Minoli& EmmaMinoli *3.*"E-Commerce " By Dr.Varinder Bhatia *4.* "Promise OfE-Governance" By M P Gupta Book published by M.P. Granth Academy , Bhopal
Suggested Digital Platforms, Web links 1. littps://onlinecourses.nptel.ac.in/nocl9 inq54/preview 2. littps://on1iriecouises.swayain2.ac.in/cecl9 cm01/prev„iew 3. littps://www.couiseia.org/lectuie/innovative-entrepreneur/e- commeice-the-internet-as-a-selling-platform-DYSNa 4. https://www.mooc-list.corn/tags/e-cominerce-inarket 5. https://on1inecourses.swayam2.ac.in/nou21 cm14/pieview 6. 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)	Class Test Assignment/Presentation	20 20 **Total Marks: 40**
External Assessment: University Exam (UE) Time: 03.00 Hours	Section (A):Short Answer type questions Section (B): Long Answer Type Questions	04 × 05 = 20 08 × 05 = 40 **Total Marks: 60**

PART A: Introduction				
Program: Diploma		Class: III SEM	Year: II Year	Session: 2022-23
Subject: Computer Application				
1.	Course Code	BCAH 206		
2.	Course Title	**Web Development using PHP**		
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	**Vocational Course**		
4.	Pre-Requisite (if any)	To study this course, a student must have the basic knowledge of Computer, Internet and simple web page designing using html.		
5.	Course Learning Outcomes(CLO)	• Understand the principles of creating an effective web page, including an in-depth consideration of information architecture. • Develop skills in analyzing the usability of a web site. • Learn the language of the web: HTML, CSS, JavaScript and PHP. • Learn to design and develop dynamic, database-driven web pages using PHP that powers many websites. • Be able to embed social media content into web pages.		
6.	Credit Value	3 Credit		
7.	Total Marks	Max. Marks : 100	Min. Passing Marks: 40	

PART B: Content of the Course		
Total No. of Lectures(in hours per week): 01 Hours per day		
Total Lectures: 60 Hours		
Unit	Topics	No. of Lectures
I	Introduction of Internet,Overview of HTML, Designing Web Formusing all HTML controls, Overview of CSS, Using important properties of CSS, Overview of JavaScript, Getting form data using JavaScript, Form data validation using JavaScript.	12
II	PHP: Introduction, WAMP, XAMP, PHP installation, Running method, syntax, comments, variables, variables scope, constants, data types , echo vs print, operators.	12
III	Branching control statements: If, If-else, elseif ladder, nested if-else, switch-case.Looping control statements: while, do-while, for and foreach.Array: Indexed Array, Associative array, multidimensional array, array functions. String, string manipulation functions, math functions.	12

IV	PHP functions: parametrized function, passing values to functions, call by value, call by reference, default arguments, recursion, PHP Form handling: get and post form, handling date and time,	12
V	PHP include and require, file handling, file upload, State management: cookies and session. MySQL Database: Introduction, creating a MySQL database and table, PHP connect and close to MySQL, perform Insert, update, delete and select operation with MySQL table using PHP.	12

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings:

1. HTML & CSS: The Complete Reference, Fifth Edition by Thomas A. Powell
2. Mastering HTML, CSS &Javascript Web Publishing by Jennifer Kyrnin Laura Lemay, Rafe Colburn
3. PHP The Complete Reference by Steven Holzner
4. Mastering PHP 7 by BrankoAjzele

Suggestive digital platform web links:

https://www.javatpoint.com/

https://www.w3schools.com/default.asp

https://www.tutorialspoint.com/web_development_tutorials.htm

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)	Class Test Assignment/Presentation	20 20 **Total Marks: 40**
External Assessment: University Exam (UE) Time: 03.00 Hours	Section (A):Short Answer type questions Section (B): Long Answer Type Questions	04 × 05 = 20 08 × 05 = 40 **Total Marks: 60**