Seva Mandal Education Society's
Smt. Kamlaben Gambhirchand Shah Department of Computer Applications
under
Dr. Bhanuben Mahendra Nanavati College of Home Science
NAAC Re-Accredited 'A+' Grade with CGPA 3.69 / 4
UGC Status: College with Potential for Excellence
'Best College Award 2016-17' adjudged by S.N.D.T. Women's University
Smt. Parmeshwari Devi Gordhandas Garodia Educational Complex
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PROGRAMME: BACHELORS IN COMPUTER APPLICATIONS

Program Objectives

1. The B.C.A. program aims to produce trained professionals in software industry for Global competency
2. To develop skilled manpower in the various areas of information technology like: Data base management, Software Development, Computer-Languages, Software engineering, Web based applications etc.
3. Acquire the knowledge, skills, experience and values to become lifelong learners able to obtain employment in a computer-related field or pursue higher studies.
4. To create an objective platform for women who would like to work independently as software developers or system analysts for any modern developing systems.

Program Outcome

Upon Graduation, the students will:

1. Develop the necessary Technical, Scientific as well as Problem Solving skills to analyse & solve real world problems within their work domain
2. Develop a thorough understanding of the nature, scope and application of computer and computer languages
3. Develop the ability and mindset to continuously update & innovate
4. Possess strong foundation for higher studies
5. The students will be professionally qualified to be employed in IT sector and Government jobs.

Program Specific Outcome

BCA programme has been designed to prepare graduates for attaining the following specific outcomes:

1. An ability to enhance the application of knowledge of theory subjects in diverse fields
2. Develop language proficiency to handle corporate communication demands
3. Preparing students in various disciplines of technologies such as computer applications, computer networking, software engineering, web designing, JAVA, database concepts and Internet programming.
4. In order to enhance programming skills of the young IT professionals, the concept of project development in using the technologies learnt during the semester has been introduced.

Eligibility

Candidates seeking admission for the B.C.A. course must have passed

Higher Secondary School Certificate Examination held at the end of XII standard conducted by the Maharashtra State Board of Higher Secondary Board or an Examination of another State or Board recognized as equivalent thereto with an aggregate not less than 45% (40% for candidates belonging to Reserved category).

OR
Three–year full time Diploma in Engineering of Technical Education Board with an aggregate not less than 45%.

OR
Three–year full time Diploma in Engineering of Technical Education Board with an aggregate not less than 60% are directly eligible for SYBCA.

SEMESTER – IV (SECOND YEAR)

Code	Subject	Courses	L	Pr./ Tu	Cr	Ext. Exam.	Int. Exam.	Total Marks
BCA401	Data Structures and Algorithms	CC	4	-	4	50	50	100
BCA402	Data Communication and Networking	CC	4	-	4	50	50	100
BCA403	Software Engineering	CC	4	-	4	50	50	100
BCA404	Internet Programming	CC	2	2	4	50	50	100
BCAL405	Data Structures and Algorithms Lab	CC	-	2	2	25	25	50
BCAL406	Programming PHP Lab	SEC	-	2	2	25	25	50
	Total				**20**			**500**

CC: Core Courses SEC : Skill Enhancement Courses

SEMESTER-IV	**1 Credit=25 Marks Total Credits = 20 Total Marks = 20*25=500**

COURSE: Data Structures and Algorithms
CREDIT - 4

Objectives:

- Introduction to linear and non-linear data structures
- Detailed study of data structures such as Array, Stack, Queue, Linked List, Tree and Graph
- Application of each data structure in Computer science

Learning Outcomes:

The students will be able to:

- Understand different types of linear, non-linear, primitive and non-primitive data structure.
- Understand different types of Array as a data structure in detail.
- Use detailed knowledge of various data structure and its applications like linked lists, stack, queue, tree and graph.
- Make a detailed study of searching and sorting algorithms.
- Make a detailed study of files and file organization and hashing.

Code No.	Course	TC	Th C	Pr C	Int	Ext	Total
BCA 4101	**Data Structures and Algorithms**	**4**	**2**	**2**	**50**	**50**	**100**

Module No.	Objective	Content	Evaluation
1	● Students will understand the difference between linear and non-linear data structures. ● Students will understand the difference between primitive and non-primitive data structures. ● Students will be able to calculate complexity of different algorithms. ● Students will understand the one and two-dimensional array and its traversal.	**1.1. Introduction:** Data Structures Basics: Definition, classification of data structure (Primitive and non- Primitive), Description of various data structure, arrays, list, stacks, queues,Trees and Graphs. Data Structure Operations **1.2. Analysis of Algorithms** Mathematical Background, Process of Analysis, Calculation of Storage Complexity, Calculation of Run Time Complexity **1.3. Arrays:** One and Two dimensional array, its Initialization, Implementation of One dimensional array in memory, Insertion, deletion of an element from One dimensional array, Traversing of an array.	Written Unit Test – I (Marks 25)
2	● Students will understand the concept of linked list and types of Linked	**2.1. Linked List:** Introduction, keyterms, Advantages & disadvantages Linear linked lists, types(Singly, Doubly, Circular) Operations(Inserting, Deleting nodes)	

	List (Singly, Doubly, Circular) in detail. ● Students will understand the concept of stack implementation and its operations, push and pop. ● Students will understand the applications of stack, Infix, Prefix Postfix notations and expression ● Students will understand the concept of queue implementation, applications of queue, types of queue(simple, circular, de-queue) and its operations.	**2.2. Stack:** Introduction, Stack implementation, operations on stack (Push, Pop), Implementation of stack using pointer, Applications of stack, Infix, Prefix Postfix notations 2.3. **Queue:** Introduction, Queue implementation, operations on Queue (Insertion, deletion), limitations of Simple Queue Circular Queue, Double ended queue(deque), Applications of queue & its types	
3	● Students will understand the binary tree. complete binary tree, binary tree and binary search tree operations represented as array and linked list. ● Students will understand traversal of tree in inorder, preorder and postorder. ● Students will understand the concept of graph representation and application of graph. Students will	**3.1.Trees:** Introduction, terminology, binary tree ,creation, operations,strictly binary tree, complete binary tree Binary tree representation,as array and linked list Teraversal(inorder, preorder ,postorder), Binary Search Tree(operations, applications representation) This needs to be introduced in order to understand the complex algorithms of trees derived from binary search tree in the later phases. Heap tree. **3.2. Graphs:** Introduction, terminology Graoh representation, application of graph, graph traversal (BFS, DFS,Shortest path), spanning tree, minimum spanning tree	Assignments will be given for the above topics. (Marks 10)

	understand concept of DFS and BFS. ● Students will understand the concept of spanning tree, minimum spanning tree		
4	● Students will understand the concept of sequential and binary search. ● Students will learn the concept of bubble sort, insertion sort, selection sort and quick sort.	**4.1 Searching and Sorting :** Searching (sequential, binary search) Sorting (Bubble sort, Selection sort, insertion sort, Merge sort and Quick sort etc)	Online Class test will be conducted. (Marks 15)
	● Students will understand the concept of modes of accessing files. ● Students will understand the concept of sequential file, direct access file, indexed sequential file. ● Students will understand the concept of hashing.	**4.2 Introduction to files & concept of record:** Definition, forming records, modes of accessing files, file organization (sequential, relative, direct access, indexed sequential files), multi key files, file systems, primitive operations on files (open/close, read/write next, read_ direct, write_ direct, update, append, allocate, deallocate) **4.3 Direct file organization:** Introduction, hashing function, properties of good hashing function	

EVALUATION:

1) On Four Modules of 50 marks
2) Final examination of 50 marks
3) Total marks = Internal 50 + External 50 = 100 Marks

REFERENCE BOOKS:

1. Cormen Thomas H, L. C. (2009). Introduction to Algorithms. The MIT Press.
2. Lipschutz, S. (2017). *Data Structures with C.* Mc Graw Hill Education.
3. Wegner, P. R. (2003). *Encyclopedia of Computer Science* . UK: John Wiley and Sons.
4. Yedidyah Langsam, M. J. (2012). *Data Structures Using C and C++*. India: Prentice-Hall.
5. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed. (2008). *Fundamentals of Data Structures in C*. Universities Press

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COURSE: DATA COMMUNICATION AND NETWORKING

CREDIT: 4

Objectives:

To familiarize students with basic networking concepts: data communication, protocols and standards, various topologies and applications of network.

Learning Outcomes:

The students will be able to:

- Independently understand basic computer network technology
- Understand and explain Data communication system and its components
- Identify the different types of network topologies and protocols
- Enumerate the layers of the OSI model and TCP/IP model. Explain the functions of each layer
- Identify the different types of network devices and their functions within a network
- Understand and building the skills of routing mechanisms
- Understand the potentials of future networking.

Code No.	Course	TC	Th C	Tu C	Int	Ext	Total
BCA402	**Data Communication & Networking**	**4**	**4**	**-**	**50**	**50**	**100**

Module No.	Objective	Content	Evaluation
1	This module will help students to understand the basics of Network, Network Topologies and types of Network. To identify the key issues for the realization of LAN/WAN/MAN network architectures.	**An Introduction to Network, Network Topologies & Types** 1.1 Data communications & representations 1.2 Ways of communication, Analog/Digital transmission & Modulation techniques (AM,FM,PM, Pulse) 1.3 Computer networks- goals & applications – Business application, Home application, Mobile user, Social issues 1.4 Network hardware – Broadcast & Point-to-point 1.5 Network Topologies (Bus, Star, Mesh, Ring and Hybrid) 1.6 Network Types – LAN, MAN, WAN, PAN, Wireless Networks, Home Networks, Internetworks 1.7 Connection-oriented & Connectionless Services 1.8 DNS	**Unit Test 1 for 5 marks**
2	To identify the importance of the OSI-7 layer	**NETWORK MODELS** 2.1 Introduction to Protocol Hierarchies 2.2 Relationship of services to protocols	**Unit Test 1 for 10 marks**

	reference model and TCP/IP protocol suite	2.3 Introduction to OSI model with all layers 2.4 TCP/IP Protocol suite	
3	To discuss the design principles of wired and wireless communication networks.	**OVERVIEW OF TRANSMISSION MEDIA** 3.1 Introduction to Guided Media – Twisted pair cable- UTP Vs STP, Coaxial cable 3.2 Unguided Media (Wireless) – Radio Waves, Microwaves, Infrared, Satellite Communication 3.3 Types of cabling and Networking tool	**Unit Test 1 for 10 marks**
4	To understand the transmission and reception of unstructured raw data between a device and a physical transmission medium.	**Physical Layer** 4.1 Analog & Digital Data, Analog & Digital signals, Periodic & Non-periodic signals, Digital Signals. 4.2 Transmission Impairments – Attenuation, Delay Distortion & Noise, Channel capacity, Line Coding. 4.3 Transmission Modes, Parallel & Serial Transmission, Asynchronous & Synchronous and Isochronous 4.4 Switching Techniques – Circuit, Message & Packet Switching 4.5 Physical layer devices – Repeaters, hubs – Active hub & Passive hub	**Viva (5 marks)**
5	To help the students acquire knowledge of the basic protocols involved in wired/wireless communication process.	**Data Link Layer** 5.1 Design Issues – Services provided to the Network Layer, Framing – Concept, Methods, Error and flow control 5.2 Random Access Control Protocol ALOHA CSMA- 1- persistent, p-persistent and non-persistent CSMA/CD, CSMA/CA 5.3 Channelization FDMA,TDMA and CDMA- Analogy, Idea, Chips, Data Representation, Encoding and Decoding, Signal Level, Sequence Generation	**Class Test for 10 marks**
6	To make students understand the functional and procedural means of transferring variable length data sequences from one node to another connected in different networks	**Network Layer** 6.1 Congestion Control – Principles & Prevention Policies 6.2 Routing – Introduction, Algorithms – Optimality Principle, Shortest path Algorithm, Flooding, Distance vector routing, Hierarchical routing, Broadcast routing, Multicast routing	**Class Test for 5 marks**
7	To help students gain knowledge about the current and future of networking	**The future of Networking - Wireless Networking** 7.1 Understanding Wireless Networking – Ethernet 802.11 Wireless & Bluetooth 7.2 Using WiFi Technology	**Class Test for 5 marks**

		7.3 Implementing a Wireless Network 7.4 Wireless Networks & Security	

EVALUATION:

1) On Modules of 25 marks
2) Final examination of 50 marks
3) Total marks = Internal 50 + External 50 = 100 Marks

REFERENCE BOOKS:

1. Computer Networks-Andrew Tanenbaum, Pearson Education [4th Edition], 2003
2. Data Communication and Networking –Behrouz Forouzan, TATA McGraw Hill [4thEdition], 2004
3. Networking All In One Dummies Wiley Publication [5thEdition] , 2013
4. SAMS Teach Yourself Networking in 24 Hours – Joe Habraken, Matt Hayden Sams Publishing [3rd Edition], 2004

COURSE: SOFTWARE ENGINEERING
CREDIT - 04

Objectives:

1. To introduce the fundamentals of software development methods
2. To study the different techniques used for software cost & effort estimation
3. To understand the importance of Software Risk Management, Testing strategies, Quality Assurance and Configuration Management during the software development process.

Learning Outcomes:

After completing the course:

1. The students will have a thorough understanding of software engineering and experiential learning opportunities to apply that knowledge to solve real-world problems.
2. The students will be able to find the cost of the manufacturing operations and assist in setting the price for the software to be developed
3. The students will be aware of what work needs to be performed, which resources of the organization will perform the work and the timeframes in which that work needs to be performed.
4. The students will understand the various software testing & Quality Assurance activities.

Code No.	Course	TC	Th C	Pr C	Int	Ext	Total
BCA403	Software Engineering	4	4	-	50	50	100

Module No	Objective	Content	Evaluation
1	To introduce the students to the basic foundations of software development using software engineering principles.	**Introduction to software engineering and project management** 1.1 Introduction to Software Engineering, Software Characteristics, Software Engineering Processes, Process framework, Software Engineering layers, SEI-CMM 1.2 Software Development Life Cycle (SDLC), Models: Water Fall Model, Prototype Model, Spiral Model, Evolutionary Development Models, Iterative Enhancement Models. Requirement analysis methods: introduction, methods	Unit Test-1 (Marks-25)
2	To introduce students to Software Planning, Cost Estimation and Risk Management techniques	**Software Planning , Cost Estimation & Risk Management:** 2.1 Software project planning : Overview, objectives, scope, resources 2.2 Metrics for software productivity and quality Productivity metrics: direct and indirect methods, size and function oriented metrics 2.3 Decomposition techniques: LOC and FP estimation, Effort Estimation: Overview, COCOMO, Automated Estimation tools. 2.4 Software Risk Analysis and Management, Risk Types, RMMM Plan	Online Test (Marks-10)
3	This will introduce the students to the basic concepts of software project scheduling & design	**Software Project Scheduling & Design** 3.1 Task definition and parallelism, effort distribution, scheduling ,Methods: PERT and CPM Software project plan outline 3.2 Software Design: Basic Concept of Software Design, Architectural Design, Low Level Design: Modularization Software design Methods: iterative, top-down, bottom-up, Design representations: flow charts, pseudo code, HIPO, Modular design: Overview, module coupling and cohesion, various types of coupling, merits and demerits.	

4	To understand the importance of Software Testing strategies, Quality Assurance & Configuration Management activities during the software development process.	**Software Testing and Quality Assurance** 4.1 Testing Objectives, Structural Testing (White Box Testing), Functional Testing (Black Box Testing), Static Testing Strategies: Formal Technical Reviews (Peer Reviews), Walk Through, Code Inspection, Compliance with Design and Coding Standards , V & V Lifecycle 4.2 Software Quality Assurance (SQA): Verification and Validation, SQA Plans, Software Quality Frameworks, ISO 9000 Models, SEI-CMM Model, Six Sigma 4.3 Software Configuration Management Activities, Version Control, Change Control Process, Configuration Audit, Reporting, Overview of CASE Tools, Software Re- Engineering, Reverse Engineering.	Individual Presentations (Marks-15)

EVALUATION:

1) On Four Modules of 50 marks
2) Final examination of 50 marks
3) Total marks = Internal 50 + External 50 = 100 Marks

REFERENCE BOOKS:

1. Roger S Pressman, Software Engineering, 5th and 7th edition, McGraw Hill publication (2010).
2. Kathy Schwalbe, Managing Information Technology Project, 6edition, Cengage Learning publication. (2013)
3. Jack T Marchewka , Information Technology Project Management , Wiley India publication.(2009)
4. KK Aggarwal, Yogesh Singh, Software Engineering 3rd edition by New Age International publication.(2007)
5. Richard H. Thayer, Software Engineering Project Management, Wiley India Publication. (2010)
6. Douglas Bell, Software Engineering for students: A Programming Approach, Pearson publication.(2005)

COURSE: INTERNET PROGRAMMING
CREDIT - 4

OBJECTIVES:

- To understand the concepts of the Internet and World Wide web such as TCP/IP, protocols, domain names, IP addresses, n-tier architecture, roles of browsers, web servers and scripting languages .
- To have an insight into the developing and configuring of non-trivial websites.
- To impart practical working knowledge of HTML, CSS and JavaScript and the principles of website design

Learning Outcomes:

Students will be able to:

- Have a thorough understanding of HTTP, Client Request, Cookies, Session Management, Server, Web Security, Virtual Hosting, Digital Signature and Certificates.
- Gain in depth knowledge of the use and implementation of HTML tags
- Apply theoretical knowledge while creating different purpose websites and interactive websites
- Analyze the requirements for and create and implement the principles of web page development.
- Create and use cascading style sheets (CSS)
- Use operators, variables, arrays, control structures, functions and objects in JavaScript.
- Create and use JavaScript programs, Identify popular JavaScript Libraries
- Create dynamic styles & animation on a web page
- Use regular expressions for form validation

Code No.	Course	TC	Th C	Pr C	Int	Ext	Total
BCA404	**Internet Programming**	**4**	**4**	**-**	**50**	**50**	**100**

Module No.	Objective	Content	Evaluation
1	Students will learn about HTTP, *web server* and gain a general understanding of its working	**Introduction to Web :** HTTP: Overview – HTTP Basics, Client request, Server response; HTTP Headers; Session Management – Persistent connections, Cookies.	Written Unit Test – I (Marks 25)
2	Students will learn about web servers and gain a general understanding of servers' activities	**General concepts on Web Server:** Configuration and Administration; virtual hosting General concepts of caching proxy server Web security, Digital signatures, Digital Certificates, Encryption, and Authentication.	
3	Students will understand: • The importance of the web as a medium of communication. • The principles of creating an effective web page, including an in-depth consideration of information architecture. • Graphic design principles that relate to web design and learn how to implement these theories into practice • And develop skills in analyzing the usability of a web site • Language of the web: HTML and CSS.	HTML: Structure of HTML Document – Meta tags, Links, Text, Lists, Tables, Inclusions (Objects, Images, and Multimedia contents); Presentation of HTML document – Style sheets, Alignment, fonts, frames; Interactive HTML document – Forms, Scripts (As scripting is	Assignments will be given for the above topics. (Marks 10)

	• How to embed social media content into web pages.		
4	Students will learn : • About JavaScript language. • To use best-practice idioms and patterns. • Concepts commonly used in dynamic language programming, such as introspection, higher-order functions, and closures. • About common libraries and tools that are used in web application development.	JAVA SCRIPT – JS Basic Variables, If...Else, Switch, Operators, JS Popup Boxes, Functions,For Loop, While Loop, Break Loops, For...In, Events, Try...Catch, Throw ,on error, Special Text Objects, String, Date, Array, Boolean, Math, JS HTML DOM, JS Advanced , JS Browser, JS Cookies, JS Validation, JS Animation, JS	Online Class test will be conducted. (Marks 15)

EVALUATION:

1) On Four Modules of 50 marks
2) Final examination of 50 marks
3) Total marks = Internal 50 + External 50 = 100 Marks

REFERENCE BOOKS:

1. Chuck Musciano, B. K. (2015). HTML and XHTML : The Definitive Guide (5th Edition ed.). O'Reilly and Associates.
2. Danny Goodman, M. M. (2010). Javacript Bible (7th Edition ed.). Yiley dreamtech india pvt. Ltd.
3. Flanagan, D. (2011). JavaScript: The Definitive Guide (6th Edition ed.). O'Reilly.
4. Jennifer Kyrnin, L. L. (2015). Teach Yourself HTML, CSS & JavaScript Web (7th Edition ed.). SAM.
5. Julie Meloni, J. K. (2018). teach yourself HTML, CSS, and JavaScript All in One (3rd Edition ed.). Pearson.
6. Pollock, J. (2013). Javascript – the Beginner's Guide (4th Edition ed.). Tata Mcgrowhill.
7. Powell, T. A. (2017). HTML and CSS the complete reference (5th Edition ed.). Tata Mcgrowhill.

COURSE: DATA STRUCTURES AND ALGORITHMS LAB
CREDIT - 2

Objectives:

- Introduction to linear and non-linear data structures
- Detailed study of data structures such as Array, Stack, Queue, Linked List, Tree and Graph
- Application of each data structure in Computer science

Learning Outcomes:

The students will be able to:

- Understand different types of Array as a data structure in detail.
- Use detailed knowledge of various data structure and its applications like linked lists, stack, queue, tree and graph.
- Make a detailed study of searching and sorting algorithms.

Code No.	Course	TC	Th C	Pr C	Int	Ext	Total
BCA 4101	Data Structures and Algorithms Lab	2	-	2	25	25	50

Module No.	Objective	Content	Evaluation
1	● Students will understand the one and two-dimensional array and its traversal.	**1.1.Arrays:** Implementations of Array and Operations- Insertion, deletion of an element from One and Two dimensional array, Traversing of an array	Practical Test and Viva (Marks 10)
2	● Students will understand the concept of linked list and types of Linked List (Singly, Doubly, Circular) in detail. ● Students will understand the concept of stack implementation and its operations, push and pop. ● Students will understand the concept of queue implementation, applications of queue, types of queue(simple, circular, de-queue) and its operations.	**2.1. Linked List:** Singular, Doubly and Circular Implementation of List and Linked List And Operations -Inserting, Deleting nodes etc **2.2. Stack:** Stack implementation, operations on stack (Push, Pop), Implementation of stack using pointer and using array. **2.3. Queue:** Queue implementation of Insertion, deletion operations on Simple Queue, Circular Queue, Double ended queue(deque)	
3	● Students will understand the tree operations represented as array and linked list. ● Students will understand traversal of tree in inorder, preorder and postorder.	**3.1 . Trees:** Implementation of tree as Array and Linked lists and Traversal (Inorder , preorder, postorder) **3.2. Graphs:** Implementation of Graph traversal (BFS, DFS, Shortest path	Assignments will be given for the above topics. (Marks 5)

	● Students will understand the concept of graph representation and application of graph. Students will understand concept of DFS and BFS.		
4	● Students will understand the concept of sequential and binary search. ● Students will learn the concept of bubble sort, insertion sort, selection sort and quick sort.	**4.1 Searching and Sorting :** Implementation of Searching (Sequential, Binary search) Sorting (Bubble sort, Selection sort, insertion sort, Merge sort and Quick sort etc)	Practical Test and Viva. (Marks 10)

EVALUATION:

1) On Four Modules of 25 marks
2) Final examination of 25 marks
3) Total marks = Internal 25 + External 25 = 50 Marks

REFERENCE BOOKS:

1. Cormen Thomas H, L. C. (2009). Introduction to Algorithms. The MIT Press.
2. Lipschutz, S. (2017). *Data Structures with C.* Mc Graw Hill Education.
3. Wegner, P. R. (2003). *Encyclopedia of Computer Science* . UK: John Wiley and Sons.
4. Yedidyah Langsam, M. J. (2012). *Data Structures Using C and C++*. India: Prentice-Hall.
5. Ellis Horowitz, Sartaj Sahni, Susan Anderson-Freed. (2008). *Fundamentals of Data Structures in C*. Universities Press

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COURSE: PROGRAMMING PHP LAB*
CREDIT : 2

Objectives:

- To help students understand the server-side programming on the web.
- To become familiar with the installation of PHP.
- To define the structure and components of a PHP program.
- To learn about built-in functions and creating custom functions in programs.

Learning Outcomes:

The students will be able to

- Build Interactive, Data Driven sites.
- Work with Form Data
- Use Cookies and Session

- Work with Regular Expression, Handle Exceptions and Validate Data

Code No.	Course	TC	Th C	Pr C	Int	Ext	Total
BCAL406	PROGRAMMING PHP LAB	2	-	2	25	25	50

Module No	Objective	Content	Evaluation
1	Students will be able to: ● understand how server-side programming works on the web. ● to learn how to install PHP. ● to write Loops, Decision Statements, Functions and pass Arguments in PHP.	**1.1.INTRODUCTION TO PHP** PHP Intro, PHP Install, PHP Syntax, PHP Variables, PHP Echo / Print, PHP Data Types, PHP Strings, PHP Constants, PHP Operators, **1.2.DECISIONS AND LOOP** Making Decisions, Doing Repetitive task with looping, PHP If…Else…Elseif, PHP Switch, PHP While Loops, PHP For Loops **1.3.FUNCTION** What is a function, Define a function, Call by value and Call by reference, Recursive function	Viva will be conducted. (Marks 5)
2	ıts will be able to: ● Store data in arrays. ● Learn how to read and write files in PHP. ● To use Exception Handling in PHP Applications for Error Handling.	**2.1. STRING** Creating and accessing String, Searching & Replacing String, Formatting String, String Related Library function **2.2. ARRAY** Anatomy of an Array, Creating index based and Associative array, Accessing array Element, Looping with Index based array, Looping with associative array using each() and foreach(), Some useful Library function **2.3. WORKING WITH FILE AND DIRECTORIES** Understanding file& directory, Opening and closing a file, Coping ,renaming and deleting a file, Working with directories, Building a text editor, File Uploading & Downloading	Quiz on Using ICT Tool EDMODO (Marks 5)

3	Students will be able to: ● Read and write Cookies. ● Efficiently search for patterns in a given text.	**3.1. SESSION MANAGEMENT** Using query string(URL rewriting), Using Hidden field, Using cookies, Using session **3.2. STRING MATCHING WITH REGULAR EXPRESSION** What is regular expression, Pattern matching in Php, Replacing text, Splitting a string with a Regular Expression	Assignment will be given on the topic (Marks 5)
4	Students will be able to learn: ● POST and GET methods in form submission. ● To receive and process form submission data. ● To create a database in phpMyAdmin. ● To read and process data in a MySQL database.	**4.1. HANDLING HTML FORM WITH PHP** PHP Form Handling, PHP Form Validation, PHP Form Required, PHP Form URL/E-mail, PHP Form Complete **4.2. DATABASE CONNECTIVITY WITH MYSQL** Introduction to RDBMS, phpMyAdmin Overview, Connection with MySql Database, Performing basic database, operation(DML) (Insert, Delete, Update, Select)	Practical Test (Marks 10)

EVALUATION:

1) On Four Modules of 25 marks
2) Final Practical Examination of 25 marks
3) Total marks = Internal 25 + External 25 = 50 Marks

REFERENCE BOOKS:

1. Murach, J., & Harris, R. (2017). Murach's PHP & MySQL. Toledo, OH, U.S.A.: Mike Murach & Associates Inc.
2. AlexanderClyde . (July 5,2019). PHP: A Step By Step Guide from Beginnerto Expert. U.S.A.: Independently published.
3. Forbes, A. (2017). The Joy of PHP Programming: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL (Fifth Edition ed.). U.S.A.: Plum Island.
4. Herbert, B. (May 23rd 2019). PHP:A Beginner's Guide. Independently Published.
5. Joyce Park Steve Suehring, T. C. (2009). PHP6 And MySQL. Wiley.
6. Mclaughlin, B. (2012). PHP & MySQL: The Missing Manual (Second Edition ed.). U.S.A.: O′Reilly.
7. Tatroe, K., MacIntyre, P., & Lerdorf, R. (2013). Programming PHP: Creating Dynamic Web Pages (Third Edition ed.). U.S.A: O'Reilly Media.
8. Welling, L., & Thomson, L. (2016). PHP and MySQL Web Development. U.S.A.: Addison-Wesley Professional.

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