

LNCT UNIVERSITY, BHOPAL

Programme:- BCA

Semester – IV

wef: July 2022

Name of Paper	Paper Code	Theory					
		Credit			Marks		
Web Technologies	BCA-401	L	T	J	EST	CAT	Total
		3	1	0	70	30	100
Course Objective		Students will gain the theoretical skills and practical experience required for web design and development and they will also learn to develop, host and maintain a responsive website.					
Units	Contents (Theory)						Hours /week
I	Introduction: Internet and World Wide Web, Evolution and History of World Wide Web, Basic features, Web Browsers; Web Servers, Hypertext Transfer Protocol, Overview of TCP/IP and its services, URLs, Searching and Web-Casting Techniques, Search Engines and Search Tools.						8
II	Web Publishing: Hosting your Site; Internet Service Provider; Web terminologies, Phases of Planning and designing your Web Site; Steps for developing your Site; Choosing the contents; Home Page; Domain Names, Front page views, Adding pictures, Links, Backgrounds, Relating Front Page to DHTML. Creating a Website and the Markup Languages.						8
III	Web Development: Introduction to HTML; Hypertext and HTML; HTML Document Features; HTML command Tags; Creating Links; Headers; Text styles; Text Structuring; Text colors and Background; Formatting text; Page layouts.						8
IV	Images: Ordered and Unordered lists; Inserting Graphics; Table Creation and Layouts; Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes; DHTML: Dynamic HTML, Features of DHTML, CSSP(cascading style sheet positioning).						8
V	Introduction to E-Commerce: Definition of Electronic Commerce, E-commerce and the Trade Cycle, Electronic Markets, Electronic Data Interchange, Internet Commerce, E-Commerce in Perspective, Types of E-commerce, Internet and Extranet, Digital signature, Mobile Commerce.						8

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Text Books/ References Book:-			
Name of Authors	Titles of the Book	Edition	Name of the Publisher
Raj Kamal	Internet and Web Technologies	II	Tata McGraw-Hill.
Ramesh Bangia	Multimedia and Web Technology	II	Firewall Media.
Thomas A. Powell,	Web Design: The Complete Reference	IV	Tata McGrawHill
Wendy Willard,	HTML Beginners Guide	I	Tata McGraw-Hill.
Deitel and Goldberg,	Internet and World Wide Web, How to Program	II	PHI.

COURSE OUTCOMES: Students will be able to

CO 1	Implement an appropriate planning strategy for developing websites
CO 2	Create a webpage and use scripting languages to transfer data and add interactive components to other web pages.
CO 3	Structure and implement HTML/CSS.
CO 4	Understand how to insert and use forms, Images and Buttons.
CO 5	Analyze the impact of E-commerce on business models and strategy

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Name of Paper	Paper Code	Theory					
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Java Programming	BCA-402	L	T	J	EST	CAT	Total
				3	1	0	70

Course Objective	<p>To understand the core language features of Java and its Application Programming Interfaces (API).</p> <p>To build applications using the set of powerful java features.</p> <p>To explore and publish a useful real time application.</p>
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Units	Contents (Theory)	Hours /week
I	Introduction; Object-Oriented Paradigm; Basic Concepts of Object-Oriented Programming Benefits of OOP; Applications of OOP. Java History; Java Features; Java Support Systems, Java Environment.	8
II	Simple Java Program; Comments in java; Java Program Structure; Java Tokens; Java Statements; Implementing a Java Program; Java Virtual Machine; Command Line Arguments; Programming Style; Constants; Variables; Data Types; Variables, Constants, Standard Default Values, Operators, Expressions; Operator Precedence; Mathematical Functions.	8
III	Decision making and Branching Statements, Looping Statements, Labeled loops, Jumping Statements, Defining a Class; Adding Variables; Adding Variables; Adding Methods; Creating Objects; Accessing Class Members; Constructors; Methods Overloading; Static Members; Nesting of Methods.	8
IV	Extending a Class; Overriding Methods; Final Variables and Methods; Final Classes; Finalizer Methods; Abstract Methods and Classes; Visibility Control; Defining Interfaces; Extending Interfaces; Implementing Interfaces; Accessing Interface Variables.	8
V	System Packages; Naming Conventions; Creating Packages; Accessing a Package; Using a Package; Adding a Class to a Package; Hiding Classes, How Applets Differ from Applications; Applet Life Cycle; Creating an Executable Applet; Passing Parameters to Applets; Aligning the Display; More about HTML Tags.	8

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Text Books/ References Book:-			
Name of Authors	Titles of the Book	Edition	Name of the Publisher
E-Balagurusamy	Programming In Java	Fourth Edition	Tata McGraw Hill
Michael B. White	Mastering Java	Second Edition	BPB Publications
Ivan Bayross	Advance Java	Second Edition	BPB Publications

COURSE OUTCOMES: Students will be able to

CO1	Understand basic concepts and benefits of Object-Oriented Programming .
CO2	Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
CO3	Explore and publish a useful real time application.
CO4	Create functionality that subclasses can implement or override.
CO5	Process of how the object is created, started, stopped, and destroyed during the entire execution of its application.

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Name of Paper	Paper Code	Theory					
		Credit			Marks		
Computer Networks	BCA-403	L	T	J	EST	CAT	Total
		3	1	0	70	30	100
Course Objective	The course objective includes learning about computer network organization and implementation, obtaining a theoretical understanding of data communication and computer networks.						
Units	Contents (Theory)						Hours /week
I	Definition of a Computer Network, Networking, Advantages and disadvantages of Networks, Components of a computer network, Use of Computer networks, Networks for companies, Networks for people, Social Issues, Classification of networks, Based on transmission technology, Type of Networks: LAN, MAN, WAN, Wireless networks.						8
II	Networks Software, Protocol hierarchy, Design issues for the layers, Merits and Demerits of Layered Architecture, The OSI Reference Model, The TCP/IP Reference Model, Comparison of the OSI & the TCP/IP Reference Models, Transmission Medium, Guided & Unguided Transmission medium, Twisted pair, Coaxial cable, Optical fiber, Wireless transmission, Electromagnetic spectrum, Radio transmission, Microwave transmission.						8
III	Data Communications, Data transmission modes, Serial & Parallel, Simplex, Half duplex & full duplex, Synchronous & Asynchronous, Network topologies, Linear Bus Topology, Ring Topology, Star Topology, Hierarchical or Tree Topology, Topology Comparison transmission, Standards – Ethernet, Token bus, Token ring, interfacing devices – bridge, hub, switch, router, gateway.						8
IV	Considerations when choosing a Topology, Switching, Circuit switching, Message switching, Packet switching, Implementation of packet switching, Multiplexing, FDM – Frequency division multiplexing, WDM – Wavelength division multiplexing, TDM – Time division multiplexing:						8
V	Modulations & demodulations, Comparison of channel access protocols, IEEE standards, Ethernets, Fast Ethernet, Gigabit Ethernet, IEEE 802.3 frame format, File transfer protocol (FTP), IP protocol (IPV4), UDP protocol.						8

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Text Books/ References Book:-			
Name of Authors	Titles of the Book	Edition	Name of the Publisher
Brijendra Singh	Data Communication and Computer Networks	2/e,	PHI
Behrouz A Forouzan	Data Communication and Computer networks	4th ed,	McGraw Hill
Achyut S Godbole	Data communications and networks,	Second ed	McGrawHill,
COURSE OUTCOMES: Students will be able to			
CO1	Characterize and understand computer networks from the view point of components and from the view point of services.		
CO2	Display good understanding of the flow of protocols in general and a network protocol in particular.		
CO3	Model a problem or situation in terms of layering concept and map it to the TCI/IP stack.		
CO4	To understand how to send a huge number of signals at the same time		
CO 5	Analysis and design of various modulation and demodulation techniques.		

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Name of Paper	Paper Code	Theory					
		Credit			Marks		
Analysis and Design of Algorithms	BCA-404	L	T	J	EST	CAT	Total
		3	1	0	70	30	100
Course Objective		<ol style="list-style-type: none"> 1. To provide a mathematical foundation for analyzing and proving the efficiency of an algorithm. 2. To focus on the design of algorithms in various domains of computer engineering. 3. To provide familiarity with main thrusts of work in algorithms sufficient to give some context for formulating and seeking known solutions to an algorithmic problem. 					
Units	Contents (<i>Theory</i>)						Hours /week
I	Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamentals of the Analysis Framework – Asymptotic Notations and Basic Efficiency Classes.						8
II	Mathematical Analysis of Non-recursive Algorithm – Mathematical Analysis of Recursive Algorithm – Example: Fibonacci Numbers – Empirical Analysis of Algorithms – Algorithm Visualization.						8
III	Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute-force string matching – Divide and conquer – Merge sort – Quick Sort – Binary Search – Binary tree- Traversal and Related Properties – Decrease and Conquer – Insertion Sort.						8
IV	Transform and conquer – Presorting – Balanced Search trees – AVL Trees – Heaps and Heap sort –Dynamic Programming – Warshall’s and Floyd’s Algorithm.						8
V	Backtracking – n-Queen’s Problem – Hamiltonian Circuit problem – Subset-Sum problem – Branch and bound – Assignment problem – Knapsack problem – Traveling salesman problem.						8
Text Books/ References Book:-							
Name of Authors	Titles of the Book			Edition	Name of the Publisher		
AnanyLevitin	“Introduction to the Design			2003	Pearson Education Asia		

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	and Analysis of Algorithm”, Pearson Education Asia		
Sara Baase and Allen Van Gelder	“Computer Algorithms - Introduction to Design and Analysis”	2003	Pearson Education Asia
Aho A.V.,Hopcroft J.E. and Ullman J.D.	“The Design and Analysis Of Computer Algorithms”	2003	Pearson Education Asia
COURSE OUTCOMES: Students will be able to			
CO1	Able to Argue the correctness of algorithms using inductive proofs and Analyze worst-case running times of algorithms using asymptotic analysis.		
CO2	Explain and apply the major algorithm design paradigms and major Computational Geometry algorithms and their analysis.		
CO3	Able to explain important algorithmic design paradigms and apply when an algorithmic design situation calls for it and analyze String matching algorithms.		
CO4	Explain the major graph algorithms and their analyses. Employ graphs to model engineering problems, when appropriate. Synthesize new graph algorithms and algorithms that employ graph computations as key components, and analyze them.		
CO5	Solve problems on decrease and conquer Backtracking, Branch and Bound strategy.		

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Name of Paper	Paper Code	Theory					
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Information and Cyber Security	BCA-405	L	T	J	EST	CAT	Total
				3	1	0	70
Course Objective	The objective of this course is to study about cyber security, laws and intrusion detection.						
Units	Contents (<i>Theory</i>)						Hours /week
I	Introduction to Cyber Security: Overview of Cyber Security, Internet Governance – Challenges and Constraints, Cyber Threats- Cyber Warfare, Cyber Crime, Cyber terrorism, Cyber Espionage, Need for a Comprehensive Cyber Security Policy, Need for a Nodal Authority, Need for an International convention on Cyberspace.						8
II	Cyber Security Vulnerabilities and Cyber Security Safeguards: Overview, Vulnerabilities in software, System administration, Open Access to Organizational Data, Weak Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness. Cyber Security Safeguards- Overview, Access control, Audit, Authentication, Biometrics, Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection Systems, Response, Scanning, Security policy, Threat Management.						8
III	Securing Web Application, Services and Servers: Introduction, Basic security for HTTP Applications and Services, Basic Security for SOAP Services, Identity Management and Web Services, Authorization Patterns, Security Considerations, Challenges.						8
IV	Intrusion Detection and Prevention: Intrusion, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection, Intrusion detection and Prevention Techniques, Anti-Malware software, Network based Intrusion detection Systems, Network based Intrusion Prevention Systems, Host based Intrusion prevention Systems, Security Information Management.						8
V	Cyberspace and the Law: Introduction, Cyber Security Regulations, Roles of International Law, the state and Private Sector in Cyberspace, Cyber Security Standards. The INDIAN Cyberspace, National Cyber Security Policy 2013.						8

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Text Books/ References Book:-			
Name of Authors	Titles of the Book	Edition	Name of the Publisher
Ankit Fadia	E-Mail Hacking	Revised Ed,2012	Vikas Publishing House .
Nina Godbole, Sunit Belapur,	Cyber Security Understanding Cyber Crime, Computer Forensic and Legal Perspectives,	2 nd Ed.	Willey India Publication
Dr M Dasgupt	Cyber Crime in India	2016	Centax Publications
Barkha U, Rama Mohan	Cyber Laws and Crimes	5 th Ed.	Universal Laws
COURSE OUTCOMES: Students will be able to			
CO1	Become familiar with the Social And Intellectual Property issues emerging From Cyberspace.		
CO2	Have depth Knowledge Of Information Technology Act And Legal Frame Work Of Right To Privacy, Data Security And Data Protection.		
CO3	Authorized, detect and raise security with solving security issues.		
CO4	Explain the fundamental concepts of Network Protocol Analysis and demonstrate the skill to capture and analyze network packets.		
CO5	Explore the legal and policy developments in various countries to regulate cyberspace.		

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Name of Paper	Paper Code	Practical				
		Credit		Marks		
Programming Lab in Java	BCA-406	P	J	ESP	CAP	Total
		2	-	30	20	50

Contents (Practical) :-

1. To demonstrate the usage of Math class.
2. To implement the methods of String class.
3. Implementation of interfaces.
4. Implementation of inheritance.
5. Implementation of super and this.
6. Implementation of static variables and methods.
7. Implementation of Exceptions.
8. To implement multithreading by extending Thread class.
9. To demonstrate FileInputStream and FileOutputStream Classes.
10. To demonstrate the creation of applets and passing parameters to applets.

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Name of Paper	Paper Code	Practical				
		Credit		Marks		
Programming Lab in Web Technologies	BCA-407	P	J	ESP	CAP	Total
		2	-	30	20	50

Contents (Practical):

1. Creating "Hello world" Application.
2. Creating an Application that displays message based on the screen orientation.
3. Create an application that displays custom designed Opening Screen.
4. Play an audio, based on the user event.
5. Create an UI with all views.
6. Create menu in Application.
7. Read/ write the Local data.
8. Create / Read / Write data with database (SQLite).
9. Create an application to send SMS.
10. Create an application to send an e-mail.
11. Display Map based on the Current/given location.
12. Learn to deploy android Applications.

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Name of Paper	Paper Code	Practical				
		Credit		Marks		
Minor Project-I	BCA-408	P	J	ESP	CAP	Total
		0	1	30	20	50

Note:- Develop project using different technologies.

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Name of Paper	Paper Code	Practical				
		Credit		Marks		
CRT Training-II	BCA-409	P	J	ESP	CAP	Total
		-	-	-	-	-

Note:- The topics included in this training are:-

Quantitative Ability:-

1. Time & Distance
2. Time and Work
3. Permutation and Combination
4. Probability
5. Set Theory
6. Allegation & Mixture

Logical Reasoning:-

1. Alphabet Test
2. Clocks
3. Puzzle Test
4. Statements and Arguments
5. Non-Verbal Reasoning
6. Cubes and Dice

Verbal Ability:-

1. Sentence Improvement
2. Reading Comprehension
3. Sentence Re- Arrangements
4. Conjunction
5. Theme Detection
6. Spellings
7. Idioms