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## **TULSIRAMJI GAIKWAD-PATIL COLLEGE OF ENGINEERING & TECHNOLOGY**

Wardha Road, Nagpur - 441108 Accredited with NAAC A+ Grade & NBA Accredited (EE, ME, CE & ECE) Approved by AICTE, New Delhi, Govt. of Maharashtra (An Autonomous Institution Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur)



## SCHEME OF INSTRUCTION Programme: Bachelor in Computer Applications First Year Bachelor in Computer Applications Semester—II

Sr	Course		Course	Sch	Teachi Ieme (h	ng rs.)	Total	%	weigh	tage	ESE	
No.	category	Course Name	Code	L	Т	Р	credits	СТ	CA	ESE	(hrs.)	TOTAL
1	DSC	Mathematics Foundations to Computer Science –II	BCA11201	3	-	-	3	30	10	60	3	100
2	DSC	Data Structures	BCA11202	3	-	-	3	30	10	60	3	100
3	DSC	Data Structures Lab	BCA11203	-	-	4	2	-	25	25	2	50
4	DSC	Operating systems	BCA11204	3	-	-	3	30	10	60	3	100
5	DSC	Operating systems Lab	BCA11205	-	-	2	1	-	25	25	2	50
6	SEC	Object Oriented Programming	BCA11206	3	-	-	3	30	10	60	3	100
7	SEC	Object Oriented Programming using Java and C++ Lab	BCA11207	-	-	4	2	-	25	25	2	50
8	SEC	Web Technologies Lab	BCA11208	-	-	2	1	-	25	25	2	50
9	VAC	Indian Constitution	BBA11206	2	-	-	2	14	06	30	2	50
10	AEC	Liberal Learning Courses II - Lab	BSH41Y01	-	-	4	2	-	25	25	2	50
				14	0	16	22	120	190	390	24	700

<b>Course Category</b>	DSC	SEC	AEC	MDE	VAC
Credits	12	6	2	0	2
Cumulative Summary	20	11	6	2	4

## TOTAL CREDITS: 19 + 20 = 39



Tulsiramji Gaikwad-Patil College of Engineering and Technology Wardha Road, Nagpur-441 108 NAAC Accredited with A+ Grade (An Autonomous Institute Affiliated to RTM Nagpur University, Nagpur)									
	<b>Program: Bachelor in Computer Application Semester – II</b>								
	Teachir	ng Scheme		Exa	minatio	n Scheme			
Ι	Lecture	3 Hrs./Week		CT-I	15 M	Iarks			
Т	utorial	-	<b>BCA11201: Mathematics Foundation</b>	CT-II	15 M	Iarks			
Total	Credits	3	to Computer Science - II	CA	10 N	larks			
Durs	tion of E	SE• 3 Hrs.		ESE	60 N	larks			
Dura		JL, J 1115.		Total	100	Marks			
Course	Objective	2 <b>5:</b>		- •.1					
1. To	apply log	ical reasoning	and proof techniques to analyze and verify a	lgorithms.					
2. To	understar	nd algebraic str	uctures and use them in cryptographic applic	cations.					
3. To	impleme	nt numerical m	ethods for solving computational and real-w	orld proble	ems.				
4. To	formulate	e and solve opti	imization problems using linear programmin	ıg techniqu	ies.				
I			<b>Course Contents</b>						
Unit I	Logic tables cond indire logic	<b>Logic and Proof Techniques with Computational Applications:</b> Propositional logic, truth tables, logical equivalence, conjunctive normal form, disjunctive normal form, quantifiers, conditional statements, tautology, contradiction, contingency, rules of inference, direct and indirect proofs, proof by contradiction, mathematical induction, algorithm correctness proofs, logical operations in programming.							
Unit I	Adva finite crypt	Advanced Algebraic Structures and Cryptographic Foundations: Groups, rings, fields, finite fields, homomorphisms, modular arithmetic in RSA encryption, basics of elliptic curve cryptography, implementation of group and ring operations, use of cryptographic libraries.							
Unit II	I Num interp progr	erical Method s, stability, co polation formu ramming projec	<b>s and Computational Algorithms:</b> Error a onvergence, bisection method, Newton-F la, Lagrange's interpolation formula, trapects for data modeling and simulations.	nalysis, at Raphson r zoidal rul	osolute a method, e, Simps	nd relative Newton's son's rule,			
Unit IV	V Optingraph Meth	<b>mization Mod</b> nical method, a nod, Vogel's A rams, integer pr	<b>lels and Linear Programming:</b> Linear simplex method, duality, transportation pr pproximation Method, MODI method, indu rogramming, resource allocation and logistic	program oblems, N ustry tools s <u>applicati</u>	ming fo North-We for solv o <u>ns.</u>	ormulation, est Corner ving linear			
Text Bo	oks								
T.1	T.1 Kenneth H. Rosen, Discrete Mathematics and Its Applications, 7th Edition, McGraw-Hill								
T.2	Education.         T.2       Sastry S. S., Introductory Methods of Numerical Analysis, 5th Edition, PHL, 2022								
Referen	ce Books								

<b>R</b> .1	Justin Solomon, Numerical Algorithms: Methods for Computer Vision, Machine Learning, and
101	Graphics, CRC Press
R.2	C. L. Liu, Elements of Discrete Mathematics, 4th Edition, McGraw-Hill Education.
Useful L	inks
1	https://archive.nptel.ac.in/courses/111/106/111106086/
2	https://archive.nptel.ac.in/courses/106/108/106108227/

	Course Outcomes	CL	Class Sessions
BCA11201.1	Apply logical reasoning and proof techniques to analyze algorithms.	3	10
BCA11201.2	Analyze algebraic structures and relate them to cryptographic systems.	4	10
BCA11201.3	Implement numerical methods for solving computational problems.	3	10
BCA11201.4	Evaluate and solve optimization problems using linear programming.	5	10

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Tulsiramji Gaikwad-Patil College of Engineering and Technology Wardha Road, Nagpur-441 108 NAAC Accredited with A+ Grade (An Autonomous Institute Affiliated to RTM Nagpur University, Nagpur)Image: College of Engineering and Technology University, Nagpur)							G		
	<b>Program: Bachelor in Computer Application Semester – II</b>								
		Teachi	ng Scheme		Exar	nination	Scheme		
	Le	cture	3 Hrs./Week		CT-I	15 N	Iarks		
	Tu	torial	-	DCA 11202: Data Stars stores	CT-II	15 N	Iarks		
[	Fotal C	Credits	3	BCA11202: Data Structure	СА	10 N	Iarks		
		e El			ESE	60 N	Iarks		
	Jurati	on of E	SE: 3 Hrs.		Total	100	Marks		
Cou	irse O	bjective	es:						
1.	To u	Inderstar	nd fundamental	data structures and their memory represent	ntations				
2.	To a	nalyze a	lgorithm comp	lexity and time-space tradeoffs					
3.	To i	mpleme	nt and operate of	on arrays, linked lists, stacks, queues, trees	s, graphs				
4.	To a	pply app	propriate data s	tructures to solve computational problems					
	1			<b>Course Contents</b>					
U	nit I	Intro Comp Opera	oduction to Dat plexity and Tim ations, Searchin	ta Structure: Classification, Abstract Dat ne-Space Tradeoff, Arrays, Array Memory ng Algorithms, Sorting Algorithms	a Types (AE / Representa	DT), Algo tion, Arr	orithm ay		
U	nit II	<b>Link</b> Lists	ed Lists: Linke , Linked List O	ed List as ADT, Linked List Memory Repr perations	resentation,	Types of	Linked		
Un	Unit III		Stacks: Stack as ADT, Stack Representation using Arrays and Linked Lists, Stack Operations, Applications of Stacks.Recursion: Recursion Notation, Applications of Recursion, Tower of Hanoi.Queue: Queue as ADT, Queue Representation using Arrays and Linked Lists, Types of Queues, Queue Operations						
		Tree	s: Tree as ADT	, Tree Memory Representation, Binary Tr	ees, Binary	Tree Tra	versals,		
Ur	nit IV	Bina	ry Search Trees	, AVL Trees.					
		Grap	ohs: Graph as A	ADT, Graph Memory Representation, Grap	oh Traversal	Algorith	ims		
lex	T 1	Come	TUL	on C E Divort D I & Stair C With	duction to A	100-11	a !! ?		
	Edition, MIT Press.								
	T.2	Karuma	unchi, N. "Data	Structures and Algorithms Made Easy," C	CareerMonk	Publicat	ions.		
Ref	erence	e Books							
	R.1 Horowitz, E., Sahni, S., & Mehta, D. "Fundamentals of Data Structures in C," 2nd Edition, Universities Press.								

	P. "Advanced Data Structures," Cambridge University Press.					
Useful Links	Useful Links					
1 <u>https://r</u>	nptel.ac.in/courses/106102064					
2 <u>https://v</u>	www.youtube.com/playlist?list=PLBF3763AF2E1C572F					

	Course Outcomes	CL	Class Sessions
BCA11202.1	Describe fundamental data structures and their operations.	1	10
BCA11202.2	Apply appropriate data structures to solve computational problems.	3	10
BCA11202.3	Analyze algorithm efficiency and data structure suitability.	4	10
BCA11202.4	Design and implement solutions using advanced data structures.	6	10

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	C	Tu (A	ılsiramji Gai n Autonomous	kwad-Patil College of Engineering a Wardha Road, Nagpur-441 108 NAAC Accredited with A+ Grade Institute Affiliated to RTM Nagpur Un	and Techn iiversity, Na	agpur)	G	
		Р	rogram: Bac	chelor in Computer Application Se	emester –	II		
	r	Feachi	ng Scheme		Exar	nination	Scheme	
	Pra	ctical	4 Hrs./Week		CT-I		-	
	Tut	orial	-	DCA11202, Data Stumatura Lab	CT-II		-	
,	Total C	redits	2	BCA11203: Data Structure Lab	CA	25 M	Iarks	
		C D	CE A H		ESE	25 M	Iarks	
	Duratio	on of E	SE: 2 Hrs.		Total	<b>50</b> M	larks	
Co	urse Ol	ojective	es:					
1.	To in	npleme	nt and analyze	fundamental linear and nonlinear data strue	ctures.			
2.	To ap	oply sea	arching and sort	ing algorithms to solve computational pro	blems.			
3.	To de	evelop 1	recursive soluti	ons and utilize stack and queue operations				
4.	То со	onstruct	and traverse tr	ees and graphs programmatically.				
Sı	r. No.			List of Practical				
	1	Write	a program for i	insertion and deletion operations in an array.				
	2	Write	a program to se	earch for an element in an array using Line	ear Search a	nd Binary	y Search.	
	3	Write	a program to so	ort an array using Bubble Sort, Selection S	ort, and Inse	ertion So	rt.	
	4 Write a program to insert an element into a Singly Linked List: a) At the beginning b) At the end c) At a specified position							
	5	Write a program to delete an element from a Singly Linked List: a) At the beginning b) At the end c) A specified element						
	6	Write	a program to in	nplement stack operations using an array.				
	7 Write a program to eva			valuate a postfix expression using a stack.				
	8	Write	a program to in	nplement simple queue operations using a	n array.			
<ul> <li>Write a program to perform the following using recursion:</li> <li>a) Find the factorial of a number</li> <li>b) Find the GCD of two numbers</li> </ul>								

	c) Solve Towers of Hanoi problem				
10 Write a program to represent a graph using adjacency matrix and adjacency list					
Text Boo	oks				
T.1	Data Structures and Algorithms Made Easy, Narasimha Karumanchi, CareerMonk Publications.				
T.2	Algorithms by Robert Sedgewick and Kevin Wayne, Addison-Wesley.				
Reference	ee Books				
R.1	Advanced Data Structures, Peter Brass, Cambridge University Press.				
R.2	The Art of Computer Programming, Volume 1: Fundamental Algorithms, Donald E. Knuth,				
	Addison-Wesley				
Useful L	inks				
1	https://nptel.ac.in/courses/106102064				
2	https://www.youtube.com/playlist?list=PLBF3763AF2E1C572F				

	Course Outcomes	CL	Class Session
BCA11103.1	Describe and explain fundamental data structures and operations.	2	6
BCA11103.2	Implement and apply basic searching and sorting algorithms.	3	6
BCA11103.3	Analyze and compare different data structures for problem-solving.	4	6
BCA11103.4	Design and create solutions using trees and graphs.	6	6

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	<b>Program: Bachelor in Computer Application Semester – II</b>								
	Γ	eachir	ng Scheme		Exar	mination	Scheme		
	Lect	ture	3 Hrs./Week		CT-I	15 N	Iarks		
	Tuto	rial	-	PCA11204 Operating Systems	CT-II	15 N	Iarks		
	Fotal Cr	edits	3	bCA11204: Operating Systems	CA	10 N	Iarks		
	Dunatia	- of F	SE. 2 Have		ESE	60 N	larks		
	Juratio	n oi E	SE: 5 Hrs.		Total	100	Marks		
Coι	irse Ob	jective	28:						
1.	To un	derstar	nd OS fundame	ntals, architecture, and various operating s	ystem types	5.			
2.	To ex	plain p	rocess manager	ment, scheduling, and multithreading conc	epts in OS.				
3.	To an	alyze p	process synchro	nization and deadlock handling mechanism	ns in OS.				
4.	To de	scribe	memory manag	gement, virtual memory, and I/O managem	ent techniqu	ues.			
	1			<b>Course Contents</b>					
U	Operating Systems Overview: Definition, Evaluation of O.S, Components & Services OS, Structure, Architecture, types of Operating Systems, Batch Systems, ConceptsUnit IMultiprogramming and Time Sharing, Parallel, Distributed and real time Systems. Operating Systems Structures: Operating system services and systems calls, systemprograms operating system structure operating systemsoperating systems					ervices of ncepts of tem			
U	nit II	Proc Schee Type Proc schee Perfo	ess Manageme duling, Process s of threads. ess Scheduling luling Preempt rmance evaluat	ent: Process Definition, Process states, Pro Control Block, Threads, Concept of mul : Definition, Scheduling objectives, Sched ive and Non-preemptive Scheduling algo tion of the scheduling Algorithms	ocess State tr tithreads, B duling algori prithms (FC	ransition enefits o ithms, Cl FS, SJF	s, Process of threads, PU and RR),		
Ur	it III	II       Process Synchronization: Introduction, Inter-process Communication, Race Conditions, Critical Section Problem, Mutual Exclusion, Semaphores, Monitors.         Deadlocks: System model, deadlock characterization, deadlock prevention, avoidance, Banker's algorithm, Deadlock detection, and recovery from deadlocks							
Memory Management: Logical and Physical add MFT, MVT, Internal and External fragmentation an Virtual Memory: Demand paging, Page Replacement thrashing.I/O Management: Principles of I/O Hardware: Dist				ent: Logical and Physical address map, l and External fragmentation and Compac Demand paging, Page Replacement algorith Principles of I/O Hardware: Disk structure	Swapping, 1 tion, Paging hms, Alloca , Disk sched	Memory g, Segmen tion of fr luling alg	allocation, ntation. ames, gorithms.		
Tex	t Books	8	×	-					
	T.1 Silberschatz, A., Galvin, P. B., & Gagne, G., Operating System Concepts (10th Edition), Wiley,								

T.2	Arpaci-Dusseau, R. H., & Arpaci-Dusseau, A. Operating Systems: Three Easy Pieces, Arpaci						
	Dusseau Books, 2018						
Reference	ee Books						
R.1	Tanenbaum, A. S., & Bos, H. Modern Operating Systems (4th Edition), Pearson, 2014						
R.2	Stallings, W. Operating Systems: Internals and Design Principles (9th Edition), Pearson, 2017						
Useful L	inks						
1	https://archive.nptel.ac.in/courses/106/102/106102132/						
2	https://onlinecourses.nptel.ac.in/noc21_cs72/preview						

	Course Outcomes	CL	Class Session
BCA11104.1	Recall types, components, and structures of operating systems	1	10
BCA11104.2	Apply process scheduling algorithms to solve process management problems	3	10
BCA11104.3	Analyze synchronization and deadlock scenarios in concurrent processes	4	10
BCA11104.4	Analyze memory management and I/O scheduling techniques in operating systems	4	10

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	Tulsiramji Gaikwad-Patil College of Engineering and Technology Wardha Road, Nagpur-441 108 NAAC Accredited with A+ Grade (An Autonomous Institute Affiliated to RTM Nagpur University, Nagpur)Image: College of Engineering and Technology Uradian Structure Uradian StructureImage: College of Engineering and Technology Uradian Structure Uradian Structure Uradian StructureUradian Structure Uradian Structure						
		P	rogram: Bac	helor in Computer Application Se	mester –	II	
	r	Feachi	ng Scheme		Exar	mination	Scheme
	Pra	ctical	2 Hrs./Week		CT-I		-
	Tut	orial	-	PCA11205. On oracting Systems Lab	CT-II		-
	Fotal C	redits	1	bCA11205: Operating Systems Lab	CA	25 N	Iarks
1	Durati		CE. 2 Harr		ESE	25 N	Iarks
	Durau	DIOLE	SE: 2 HIS.		Total	50 N	larks
Co	arse Ol	ojective	25:				
1.	Unde	erstand	and implement	fundamental operating system algorithms	in C.		
2.	Anal	yze pro	cess scheduling	and memory management techniques practice	ctically.		
3.	Appl	y synch	ronization and	deadlock avoidance methods in real scenar	rios.		
4.	Dem	onstrate	e Linux comma	nd-line proficiency for system administrati	on tasks.		
Sr. No. List of Practical							
	1	Illustr	ate the IPC mee	chanism using Pipes by writing a C program	m.		
	2	Simul	ate the FCFS C	CPU Scheduling algorithm using a C program.			
	3	Simul	ate the SJF CP	U Scheduling algorithm using a C program	l <b>.</b>		
	4	Simul	ate the Round I	Robin CPU Scheduling algorithm using a C	C program.		
	5	Imple	ment the Produ	cer–Consumer problem using semaphores	in C.		
	6	Simul	ate Bankers Alg	gorithm for Deadlock Avoidance using a C	program.		
	7	Simul	ate Paging men	nory management technique using a C prog	gram.		
	8 Simulate Segmentation memory management technique using a C program.						
	9 Demonstrate basic Linux file and process management commands using a shell script.			pt.			
	10 Demonstrate file permissions and ownership in Linux using a shell script.						
Tex	t Book	S					
	T.1	Silberso	chatz, A., Galvi	n, P. B., & Gagne, G., Operating System C	Concepts, 10	)th Editic	on, Wiley,

	2018.
T.2	Tanenbaum, A. S., & Bos, H., Modern Operating Systems, 4th Edition, Pearson, 2014.
Reference	ce Books
R.1	Arpaci-Dusseau, R. H., & Arpaci-Dusseau, A. C., Operating Systems: Three Easy Pieces,
101	Arpaci-Dusseau Books, 2018
R.2	Kerrisk, M., The Linux Programming Interface: A Linux and UNIX System Programming
1	Handbook. No Starch Press, 2010
Useful L	inks
1	https://archive.nptel.ac.in/courses/106/105/106105214/
2	https://www.youtube.com/playlist?list=PLf3ZkSCyj1tdCS2oCYACXO6x-VKpDIMB6

	Course Outcomes	CL	Class sessions
BCA11205.1	Explain fundamental operating system concepts and structures.	2	6
BCA11205.2	Apply process scheduling and memory management algorithms using C.	3	6
BCA11205.3	Analyze synchronization and deadlock scenarios in concurrent systems.	4	6
BCA11205.4	Create shell scripts for Linux-based system administration tasks.	6	6

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		P	rogram: Bac	helor in Computer Application Se	emester –	II	
Teaching Scheme Examin					nination	Scheme	
	Lect	ure	3 Hrs./Week		CT-I	15 N	Iarks
	Tuto	rial	-	BCA11206: Object Oriented	CT-II	15 N	Iarks
,	Total Cr	edits	3	Programming	CA	10 N	Iarks
1	Duratio	n of F	SF• 2 Hrs		ESE	60 N	Iarks
			SE, 2 1118.		Total	100	Marks
Co	urse Ob	jective	28:				
1.	To un	derstar	nd OOP fundam	nentals and language basics in Java and C+	++		
2.	To ap	ply cor	e programming	constructs and control structures effective	ely.		
3.	To im	plemei	nt classes, inher	itance, and advanced OOP features.			
4.	To uti	lize me	odularity, excep	ption handling, and advanced programming	g concepts.		
				<b>Course Contents</b>			
U	Unit IIntroduction to Object Oriented Programming: Fundamentals of Object Oriented Programming, benefits and applications of OOP, programming paradigms: procedural v object-oriented, evolution and history of Java and C++, key differences between Java an C++, Java features, JVM, Java program structure, Java tokens, command line argument C++ program structure, tokens, keywords, identifiers, variables, data types, input/output output operations				Oriented edural vs Java and rguments, put/output		
U	nit II	Core initia expre	<b>Programmin</b> lization, symbo essions, operato nents, looping	<b>ag Constructs:</b> Constants, variables, oblic constants, typecasting, input/output for precedence and associativity, type of statements, jump statements.	data types, in Java and conversions,	declara 1 C++, decisio	ation and operators, on-making
U	Unit IIIClasses, Objects, and Advanced OOP Features: Defining classes and objects, access specifiers, constructors and destructors, constructor overloading, method overloading, stati members, inheritance and its types, method overriding, use of super (Java) and base (C++ abstract classes and interfaces (Java), pure virtual functions and abstract classes (C++), array (1D, 2D, dynamic), strings: Java String class, C++ string library, collections, wrapper classe enumerated types					cts, access ding, static ase (C++), ++), arrays per classes,	
U	nit IV	Pack name excep multi JavaF frame contr	ages, Namespa spaces, header otion handling threading basic FX/Swing; Qt/ eworks: JUnit f ol basics.	<b>ces, Exception Handling:</b> Java packages files, exception handling in Java, use in C++, standard and user-defined e es: Java Thread class, Runnable interface WinAPI, design patterns: Singleton, Fa For Java, Google Test for C++, software	(system and er-defined e exceptions e; C++11 th actory, Obs engineering	user-def exception in C++, reads, G erver, u principl	ined), C++ is in java, file I/O, UI basics: nit testing es, version

Text Boo	oks
T.1	Herbert Schildt, "Java: The Complete Reference", 12th Edition, McGraw-Hill.
Т.2	Stanley B. Lippman, Josée Lajoie, Barbara E. Moo, "C++ Primer", 5th Edition, Addison-Wesley.
Reference	ce Books
<b>R</b> .1	Cay S. Horstmann, Gary Cornell, "Core Java Volume I – Fundamentals", 12th Edition, Prentice
101	Hall.
<b>R</b> .2	Scott Meyers, "Effective C++: 55 Specific Ways to Improve Your Programs and Designs", 3rd
102	Edition, Addison-Wesley.
Useful L	inks
1	https://onlinecourses.nptel.ac.in/noc22_cs47/preview
2	https://onlinecourses.nptel.ac.in/noc21_cs02/preview

	Course Outcomes	CL	Class sessions
BCA11206.1	Describe OOP concepts and language features.	1	7
BCA11206.2	Apply programming constructs to solve problems.	3	7
BCA11206.3	Analyze and implement advanced OOP features.	4	7
BCA11206.4	Develop modular, robust code using advanced techniques.	6	7

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		P	rogram: Bac	helor in Computer Application Se	mester –	II	
		Teachi	ng Scheme		Exar	nination	Scheme
	Pra	ctical	4 Hrs./Week		CT-I		-
	Tu	torial	-	BCA11207: Object Oriented	CT-II		-
,	Total (	Credits	2	Lab	СА	25 N	Iarks
		C E	CE ALL		ESE	25 N	Iarks
	Durat	on of E	SE: 2 Hrs.		Total	50 N	larks
Co	urse O	bjective	es:				
1.	To c	evelop o	object-oriented	programs using Java and C++ core feature	es.		
2.	To i	npleme	nt inheritance,	polymorphism, and exception handling in a	applications	•	
3.	To a	pply mu	ltithreading an	d GUI design for interactive software solut	tions.		
4.	Тос	rganize	code using pac	kages, namespaces, and modular programm	ning princip	oles.	
Sı	Sr. No. List of Practical						
	Apply the concept of programs.		the concept of ams.	command line arguments to process user input at runtime in Java and C++			
	2	Demo C++.	nstrate implicit	t and explicit type conversions between d	ifferent data	a types in	n Java and
	3	Constr flow.	ruct programs u	tilizing decision making, looping, and jump	p statements	s to contr	ol program
	4	Impler C++.	ment constructo	ors and destructors to manage object initial	ization and	cleanup i	n Java and
	5	Illustra keywo	ate multilevel ords to access p	inheritance and demonstrate the use of arent class members.	super (Java	a) and b	ase (C++)
	6	Differ both c	entiate betweer oncepts in Java	n method overloading and overriding by de and C++.	eveloping pr	ograms t	hat exhibit
	7	Create encaps	e and utilize sulate code mo	user-defined packages (Java) or namesp dules.	paces (C++	) to org	anize and
	8 Develop exception handling mechanisms to handle divide by zero errors gracefully in Java and C++.				n Java and		
	9	Constr thread	ruct concurrent s, to analyze ba	programs using Thread class and Runnabl asic multithreading concepts.	le interface	in Java, a	and $C++11$
	10 Design simple graphical user interfaces using Swing (Java) and Qt (C++) frameworks to demonstrate event-driven programming.						
Tex	t Boo	ks					
	T.1	E. Bala	gurusamy, Obj	ect Oriented Programming with C++, 8th H	Edition, Mc	Graw Hil	1

	Education, 2020.			
T.2	Herbert Schildt, Java: The Complete Reference, 12th Edition, McGraw Hill Education, 2022.			
Reference	ee Books			
R.1	Bjarne Stroustrup, The C++ Programming Language, 4th Edition, Addison-Wesley, 2013.			
R.2	Kathy Sierra, Bert Bates, Head First Java, 3rd Edition, O'Reilly Media, 2022.			
Useful L	inks			
1	https://onlinecourses.nptel.ac.in/noc25_cs34/preview			
2	https://www.shiksha.com/online-courses/programming-in-java-by-nptel-course-nptel22			

	Course Outcomes	CL	Class sessions
BCA11205.1	Apply command line arguments and type conversions in Java and C++.	3	6
BCA11205.2	Analyze and implement decision making, looping, and exception handling constructs.	4	6
BCA11205.3	Design object-oriented solutions using inheritance, polymorphism, and modularization.	6	6
BCA11205.4	Develop multithreaded and GUI-based applications using Java and C++.	5	6

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	C		ılsiramji Gai n Autonomous	kwad-Patil College of Engineering a Wardha Road, Nagpur-441 108 NAAC Accredited with A+ Grade Institute Affiliated to RTM Nagpur Un	and Techr	nology agpur)	G
		P	rogram: Bac	helor in Computer Application Se	mester –	II	
	Teaching Scheme     Examination Scheme					Scheme	
	Pra	octical	4 Hrs./Week		CT-I		-
	Tu	torial	-	BCA11208: Web Technology I ab	CT-II		-
,	Fotal C	Credits	2	DCA11200. Web Technology Lab	CA	25 M	larks
1	Durati	on of F	SF. 7 Hrs		ESE	25 M	larks
	Durau		512. 2 1115.		Total	<b>50</b> M	larks
Cou	arse O	bjective	es:				
1.	To u	ndersta	nd fundamental	concepts of HTML, CSS, and web techno	logies.		
2.	To a	pply cli	ent-side scriptin	ng for dynamic, interactive web page devel	lopment.		
3.	To d	lesign ar	nd validate web	forms using JavaScript and CSS.			
4.	To c	reate an	d display struct	tured data using XML and related tools.			
Sı	Sr. No. List of Practical						
	1	Desig headir	n a basic HTN 1gs, paragraphs	IL page displaying your name, course, a , and line breaks	and a short	introduc	tion using
2 Create a web page that uses ord navigation between sections and to			e a web page ation between s	that uses ordered, unordered, and defini ections and to external sites	tion lists. A	Add hype	erlinks for
	3	Build using	a registration forms	orm with input fields for name, email, phon	e, address, a	and cours	e selection
	4	Add i backg	nternal, extern rounds, borders	al, and inline CSS to a previously creat s, and layout	ed HTML	page to	style text,
	5	Use H conter	TML and CSS	to design a responsive layout with a nav sts to different screen sizes	vigation bar	, sidebar,	, and main
	6	Write forma	a JavaScript pr t before submis	ogram to validate the registration form for sign	empty field	ls and con	rrect email
	7	Create naviga	e a web page wate to different	vith an image map. Define clickable hotsp sections when clicked	ots that dis	play info	rmation or
	8	Write to disp	an XML docur play the data in	ment to store student details. Use a simple a table format	HTML or	JavaScrip	ot program
	9	Create perfor	e a web page wh med dynamical	ere users can enter numbers and see the sun lly using JavaScript	n, average, o	or other ca	alculations
	10 Combine HTML, CSS, and JavaScript to design a multi-page static website for a college department, including a home page, faculty list, events, and a contact form						
Tex	t Boo	ks					
	T.1	Ducket	t, Jon. HTML a	nd CSS: Design and Build Websites. Wile	У		
L							

T.2	Robbins, Jennifer Niederst. Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics. O'Reilly Media, 5th Edition			
Reference Books				
R.1	Haverbeke, Marijn. Eloquent JavaScript: A Modern Introduction to Programming. No Starch Press, 3rd Edition			
R.2	JavaScript: The Definitive Guide, David Flanagan, O'Reilly Media, 7th Edition			
Useful Links				
1	https://nptel.ac.in/courses/106105084			
2	https://nptel.ac.in/courses/106106156			

	Course Outcomes	CL	Class sessions
BCA11208.1	Recall basic HTML and CSS tags for web development.	1	6
BCA11208.2	Explain the structure and purpose of web page components.	2	6
BCA11208.3	Apply JavaScript to create interactive web form validations.	3	6
BCA11208.4	Design and develop a multi-page static website project.	6	6

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	<b>Program: Bachelor in Computer Application Semester – II</b>						
	T	eachir	ng Scheme		Exar	nination	Scheme
Lecture 2 H		2 Hrs./Week		CT-I	07 Marks		
Tutori		rial	-	<b>PDA11206: Indian Constitution</b>	CT-II	07 Marks	
	Total Credit		2	BBA11206: Indian Constitution	CA	06 Marks	
	Juratio	n of F	SF• 2 Hrs		ESE	30 Marks	
			5E, 2 III 5,		Total	50 Marks	
Coι	Irse Ob	jective	28:				
1.	To un	derstar	nd history, struc	cture, Preamble, rights, duties, and state po	licy.		
2.	To exp	plain r	oles, powers, st	ructures of Union and State governments.			
3.	To dea	scribe	local administra	ation: district, municipal, and panchayat go	overnance sy	ystems.	
4.	To and	alyze I	Election Comm	ission's structure, roles, and electoral func	tioning in Ir	idia.	
				<b>Course Contents</b>			
U	Unit IThe Constitution – Introduction: The History of the Making of the Indian Constitution, Preamble and the Basic Structure, and its interpretation, Fundamental Rights and Duties and their interpretation, State Policy Principles					stitution, Outies and	
Unit II		Union Government: Structure of the Indian Union, President – Role and Power, Prime Minister and Council of Ministers, Lok Sabha and Rajya Sabha State Government: Governor – Role and Power, Chief Minister and Council of Ministers, State Secretariat					
Ur	it III	Loca	l Administrati	on: District Administration, Municipal C	corporation,	Zila Pan	chayat
Ur	Unit IVElection Commission: Role and Functioning, Chief Election Commissioner, State Election Commission						
Tex	t Books						
	T.1 Ba	isu, D.	D. (2023). Intro	oduction to the Constitution of India. Lexis	Nexis.		
	T.2 Jai	in, M.I	P. (2022). India	n Constitutional Law. LexisNexis.			
Ref	erence	Books					
R.1 Shukla, V.N. (2024). Constitution of India (Revised by Mahendra Pal Singh). Eastern Book Company.							
	R.2 Bakshi, P.M. (2023). The Constitution of India. Universal Law Publishing.						
Use	Useful Links						
	1 <u>https://www.constitution.org/cons/india/const.html</u>						

2 http://www.legislative.gov.in/constitution-of-india

	Course Outcomes	CL	Class sessions
BCA11108.1	Recall key features and principles of the Indian Constitution.	1	7
BCA11108.2	Explain the structure and functions of Union and State governments.	2	7
BCA11108.3	Apply knowledge to describe local administrative systems in India.	3	7
BCA11108.4	Analyze the role and functioning of the Election Commission.	4	7

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