Govt. Digvijay Autonomous PG College Rajnandgaon (C.G.)



SCHEME OF EXAMINATION & SYLLABUS

FOR
THE FOUR-YEAR UNDER GRADUATE PROGRAMME
(FYUGP)

BACHELOR OF COMPUTER APPLICATION
(BCA- 1st& 2^m) SEMESTER EXAM

UNDER

DEPARTMENT OF COMPUTER APPLICATION

SESSION – 2025-26

(APPROVED BY BOARD OF STUDIES)

Govt. Digvijay Autonomous PG College, Rajnandgaon(CG)

Department of Computer Application

Session – 2025 -26

List of Members of Board of Studies (BOS)

S.No	Name of Member	Nominee Type	Signature
1	Mrs. Hempushpa	Chairman	Jan.
2	Dr. Durga Prasad Rao	VC Nominee	
3	Prof. Gulame Mustafa Ansari	Principal Nominee	(Amou
4	Prof. Shailendra Arya	Principal Nominee	652
5	Mr. Anshu Ramteke	Adviser Member	
6	Ms. Nadini sahu	Ex-Student	

SYILABUS AND MARKING SCHEME

BCA- IST Semester

S.	Course	Course-			Theory	Internal	Tota	Total Marks	
No	Туре	code	Subject	Credit	Marks	Marks	Max	Min	
1		CASC - 01	Discrete Mathematics	4	70	30	100	40	
2		CASC - 02T	Computer Fundamental MS Office	3	70	30	100	40	
	DSC	CASC - 02 P	Lab 1 : MS Office	1	35	15	50	20	
3	Doc	CASC - 02 T	Operating System	3	70	30	100	40	
4		CASC - 03 P	Lab 2 : Operating System	1	35	15	50	20	
5	GE	CAGE - 01	Choose one from pool of GE	4	70	30	100	40	
6	VAC	CAVAC-01	Choose one from pool of VAC	2	35	15	50	20	
7	AEC	AEC	English Language	2	35	15	50	20	
		TO		20	-	-	600	-	

BCA- IIND Semester

S.	Course	Course			Theory	Internal	Tota	al Marks
o. Io	Course Type	Course- code	Subject	Credit	Marks	Marks	Max	Min
1		CASC - 04	Digital Electronic	4	70	30	100	40
_	DSC	CASC - 05T	Programming in C++	3	70	30	100	40
2	(Major/	0.100	Lab 3 : Programming in C++	1	35	15	50	20
3	Core)	CASC - 06 T	Data structure	3	70	30	100	40
4		CASC - 06 P	Lab 4: Data structure	1	35	15	50	20
5	GE	CAGE - 02	Choose one from pool of GE	4	70	30	100	40
6	SEC	CASEC -01	Choose one from pool of SEC	2	35	15	50	20
7	AECC		Hindi Language	2	35	15	50	20
		то	TAL	20	-	-	600	-

DSC- Discipline Specific Course,

DSE- Discipline Specific Elective

AEC-Ability Enhancement Core Course,

SEC-Skill Enhancement Course,

GE- Generic Elective,

VAC- Value Added course

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			Co	URSE	CURRICUL	UM	
P	ART	- A: Intro	duction				
		m: Bachelor in Co ute / Diploma / De		m	Semester -H		1-2025 , 5-26
I	1	rse Code	CASC-04		to the same of the	Control of the Contro	
	Cor	rse Title	Digital Electr	onics	Annual Control of Maryon (See 1) and the state of the sta	A STATE OF THE PARTY OF THE PAR	
3		rse Type	DSC (Discipli	V	ic Course)	and another the service of the second as the second	
1	-	requisite	As per prograt			Annual Control of the	
5	Coi	irse Learning	At the end of this To under electronic Understa To under application	course, the estand the estand how the stand and on in digita	e computer system i examine the structu	epts and techniques use dentifies the data inside. re of various number sys	stems and its
	Ou	teomes (CLO)	 To Perform The ability sequentian To identify 	rm basic and the total t	rithmetic calculation erstand, analyze an ic requirements acco circuit and design it	s in binary, decimal and he design various combined to the specification in a cost effective manner.	national and 1 for a newly r.
6		edit Value	4 Credits			earning & Observation	
7	To	al Marks	Max. Marks:	100		Min Passing Marks:	40
(binary, de arithmetic data(binary and its cla (Excess-3 Error dete (hamming II BOOLEA sum, simpi K-Map.		(binary, decimal, arithmetic operar data(binary repres	octal, hexadecim tions, complement sentation of integer	al etc.), ints in the rs, fixed p	inter-conversion be number system, oint and floating po	roduction of number syst tween the number syst representation of nur int data representation),c	neric
		(Excess-3 code G	ray code etc.), al code like (parity	phanumer	ic code like (ASCII	etc., non-weighted code I, UNICODE, EBCDIC Error correcting codes	etc.),
		BOOLEAN ALC sum, simplification K-Map. FUNDAMENTA	GEBRA: Boolean on of Boolean exp	ression us	ing simplification to	s, sum of product, product, product, product, product learn law	s and and its 15
	III	properties, Logic gate and its types, Construction of basic digital circuits using fundamental gates as well as Universal gates, simplification of digital circuit. Types of digital circuits (combinational circuit, sequential circuits). COMBINATIONAL CIRCUIT: Adder (half adder, full adder, N bit adder), Subtractor (half					
		subtractor, full su Comparator, Cod SEQUENTIAL	ibtractor, N bit su e Convertor CIRCUIT: Multi	btractor), vibrators/	Decoder, Encoder. Latch, Flip- flop a	Multiplexer, De-multip nd its types (S R flip fl egister and its types, Co	op, D 15
ı	IV	and its types. MICROPROCE components in	ESSORS: Introduce microprocessor,	tion of mi	croprocessor, evolu	ntion of microprocessor, ruction, addressing messor), designing of	basic Se
101	n E	microprocessor (Knin Dr.k. S. Duhy)	8086 microproces	sor).	Amus	Dr.S. Jain	Oth Khundley

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	ram: Bachelor in (omputer Application	Semester - H	Session: 2021-202.	,		
Certif	icate / Diploma / D	egree/Honors)	and the same of th	25-20			
C	ourse Code	CASC-05T		The subsequent terms of the second se			
C	ourse Title	Programming in C++	and the substitution of the control	and the property of the second			
C	ourse Type	DSC (Discipline Speci	fic Course)	A control to the state of the s	and the second second		
P	rerequisite	As per program					
. 0	ourse Learning. utcomes (CLO)	 Write programs of Define functions. Write programs for Develop small programs. 	indamentals of object or clated to concept of obje- class and to create own or file handling. ograms to solve - real w	riented programming. ect oriented program Libraries.			
	redit Value		and the second s	Ain Passing Marks: 4	0		
	otal Marks	and the second s	And the second s	Till Fassing Francis			
ART	-B: Conte	ent of the Course	de (01 Uz por perio	d) - 45 Periods (45 Hou	ırs)		
	Total No. of Te			d) - 45 Periods (45 Hou	No. 0		
Unit		•	Course contents)		Perio		
l	Introduction and Programming Concepts: Definition of Program, Source file, Object file, Executable file, Header file, Language Translator- Assembler, Interpreter, Compiler, Testing, Debugging, Linker and Loader, Algorithms, Flow Charts, History of C language, Structure of C program, C Tokens: Identifiers, Keywords, Constants, Variables, Operators, Data Types, Control structure: Conditional and looping statements, Operator Precedence and Associativity, Array and its types, Pointer, Functions: Standard Library and User defined functions, function prototype, Call by value and Call by reference, recursive functions, String functions.						
11	Introduction to programming, Fer objects, Access Sp	Object Oriented Proatures of C++, Structure of Decifiers: Private, Public, Fuctor: Default constructor	C++ program, Data ty Protected, inline function	pes, structure, class and ons, static data and static	11		
1111	Inheritance and Inheritance: Sin Polymorphism: D overloading, con	Polymorphism: Definition gle, Multilevel, Multiphe definition, Compile time postructor overloading, Run nline function, friend function	le, Hierarchical and olymorphism: Function ntime polymorphism:	I Hybrid Inheritance. n overloading, Operator	11		
IV	Input-Output an I/O. Object I/O. Exception Handl catch and throws	d File Handling: I/O clas File Pointer, Opening and C ing and Standard Templ keywords, Template.	sses, File and Stream c Closing file. ate Library: Definition	on, Exception basics, try,	11		
	Tokan Identifiar	V		- k' - 1 1 - ' - C	iclar.		
ywords	Template.	Keyword, Array, Function,	Class, Object, Polymor	prism, inneritance. Constru			

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- · Peter Juliff, Program Design, PHI Publications.
- · Yashwant Kanetkar, Let us C: BPB Publications.
- E. Balaguruswamy, Programming in ANSIC, Tata McGraw Hill

Reference Books Recommended:

- Y. Kanetkar, Let us C++, B.P.B Publication
- E. Balaguruswamy, Programming in C++, Tata McGraw Hill.
- R. Kumar, Object Oriented Programming with C++, Prakhar Publication(Hindi)
- Dhupiya, Lakhyani, C++ Programming Alka Publications, Ajmer (Paperback, Dhupiya, Lakhyani)(Hindi)

Online Resources:

- Introduction to C and C++ from SWAYAM/NPTEL
 https://onlinecourses.nptcl.ac.in/noc22_cs103/preview
 https://www.youtube.com/watch?v=KG4hjVDw-p8&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=2
- Constant and Inline Function through NPTEL: https://www.youtube.com/watch?v=pX6LufLso2M&list=PLmp4ylk-B4KrM9uOEdvPlVFUkU3jNc6D2&index=10
- Pointer and Reference NPTEL https://www.youtube.com/watch?v=GtsBZ5el-cE&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=12
- Function Overloading NPTEL https://www.youtube.com/watch?v=uJGmGAShHeU&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=13
- Operator Overloading NPTEL https://www.youtube.com/watch?v=0jpOwe4d-FE&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=17
- Dynamic Memory Management NPTEL https://www.youtube.com/watch?v=lkFK2X6qle0&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=18
- Class and Object NPTEL
 https://www.youtube.com/watch?v=wtuks_f3vP4&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=24
- Access Specifiers NPTEL
 https://www.youtube.com/watch?v=6ki_W7cXdM0&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=22
- Constructor and Destructor NPTEL https://www.youtube.com/watch?v=wtuks_f3vP4&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=24
- C++ different topics from W3School https://www.w3schools.com/CPP/default.asp
- C++ different topics from Javatpoint https://www.javatpoint.com/cpp-tutorial

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Suggested Continuous E		
Maximum Märks: Continuous Internal Ass End Semester Exam (ES		
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Quiz-(2): 20 +20 Assignment / Seminar - 10 Total Marks - 30	obtained marks in Assignment shall be
End Semester Exam (ESE):	Section A: O1 Objective - 10 x1=	= 10 Mark; Q2. Short answer type- 5x4 20 Marks e qts.,1 out of 2 from each unit-4x10=40 Marks
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PA	RT- A: Introdu	ction		
	gram: Bachelor in Com tificate / Diploma / Degr		Semester - II	Session: 2021-2025 ,
1	Course Code	CASC-05P		42 -Ye
2	Course Title	Lab 3: Programn	ning in C++	
	Course Type	Practical		
4	Prerequisite	As per program		
Ψ.	Course Learning Outcomes (CLO)	 Understand the which are essent to Code, test, and the customer terms and the customer terms allocation and passing. Develop and the customer terms are customer terms and the customer terms are customer terms. 	sential to create good C++ and implement a well-structure the programming language. The modules (collections of design/implementation and binding, control flow in-depth understanding or gramming paradigms.	programs ctured, robust computer program functions). issues involved with variable ty, types, subroutines, parameter of functional, logic, and object-
6	Credit Value	1 Credits Cred	lit =30 Hours Laborato	ry or Field Learning/Training
7	Total Marks	Max. Marks:	50 Mii	n Passing Marks: 20

PART -B: Content of the Course

		Total No. of learning-Training/performance Periods: 30 Periods (30 Hours	No. of
Module		Topics (Course contents)	Perioc
List of Practical	1.	Write a program in C++ for addition of two numbers using float data type.	
Experiment	2.	Write a program in C++ to find the biggest number between two numbers.	
s.	3.	Write a program in C++ to find the factorial value of any entered number using do – while loop.	
	4.	Write a program in C++ for various arithmetic operations using switch case statements.	
	5.	Write a program in C++ for Multiplication of two 3X3 matrices.	
	6.	Write a program in C++ to store five books of information using structure.	
	7	Write a program in C++ to store six employee information using union.	
	8.	Write a program in C++ to calculate simple interest using call by value and	
		call by reference method	30
	9.	Write a program in C++ to find the sum and average of five numbers using	30
		class and objects.	
		Write a program in C++ to multiply two numbers using private and public member functions.	
	11.	Write a program in C++ to print structure like this using scope resolution	
		operator	1
1 d d d d d d d d d d d d d d d d d d d		ĺ	
		12	
And the second s		123	
		1234	
		12345	
	12	Write a program in C++ for constructor and Destructor.	

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- 13. Write a program in C++ for multiple inheritance.
- 14. Write a program in C++ for operator overloading.
- 15. Write a program in C++ for friend class and friend function.
- 16. Write a program in C++ for virtual function and virtual class.
- 17. Write a program in C++ for Exception Handling
- 18. Write a program in C++ to open and close a file using file Handling.
- 19. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
- 20. WAP to display Fibonacci series (i) using recursion, (ii) using iteration
- 21. WAP to calculate Factorial of a number (i) using recursion, (ii) using iteration
- 22. WAP to calculate GCD of two numbers (i) with recursion (ii) without recursion.
- 23. Create a Matrix class using templates. Write a menu-driven program to perform following Matrix Operations (2-D array implementation): a) Sum b) Difference c) Product d) Transpose 22. Create the Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain the respective information in the classes and create, display and delete objects of these two classes (Use Runtime Polymorphism).

24. Create a class Triangle. Include overloaded functions for calculating area.

Overload assignment operator and equality operator. 25. Create a class Box containing length, breadth and height. Include following methods in it: a) Calculate surface Area b) Calculate Volume c) Increment, Overload ++ operator (both prefix & postfix) d) Decrement, Overload -operator (both prefix & postfix) e) Overload operator == (to check equality of two boxes), as a friend function f) Overload Assignment operator g) Check if it is a Cube or cuboid

26. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.

27. Write a program to retrieve the student information from the file created in the previous question and print it in the following format: Roll No. Name

28. Copy the contents of one text file to another file, after removing all whitespaces.

29. Write a program for exception handling.

30. Write a program to insert data into file and to display it.

Note: Concerned teacher can add additional experiment as per requirement.

Keywords

Array, Function, Structure, union, matrix, constructor, destructor, inheritance.

Name and Signature of Convener & Members of Bos; Ozther Hotel King Chairman Drk. B. Dubey P

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

Peter Juliff, Program Design, PHI Publications.

Yashwant Kanetkar, Let us C: BPB Publications.

E. Balaguruswamy, Programming in ANSI C, Tata McGraw Hill

Reference Books Recommended:

Y. Kanetkar, Let us C++, B.P.B Publication .

E. Balaguruswamy, Programming in C++, Tata McGraw Hill.

- R. Kumar, Object Oriented Programming with C++, Prakhar Publication(Hindi)
- Dhupiya, Lakhyani, C++ Programming Alka Publications, Ajmer (Paperback, Dhupiya, Lakhyani)(Hindi)

Online Resources:

- Introduction to C and C++ from SWAYAM/NPTEL https://onlinecourses.nptel.ac in/noc22_cs103/preview https://www.youtube.com/watch?v=KG4hjVDw-p8&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3;Nc6D2&rndex 2
- Constant and Inline Function through NPTEL: https://www.youtube.com/watch?v=pX6LufLso2M&fist=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=10
- Pointer and Reference NPTEL https://www.youtube.com/watch?v=GtsBZ5c1-cE&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=12
- Function Overloading NPTEL https://www.youtube.com/watch?v=uJGmGAShHeU&list=PLmp4ylk-B4KrM9uOEdvPlVFUkU3jNc6D2&index=13
- Operator Overloading NPTEL https://www.youtube.com/watch?v=0jpOwe4d-FE&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=17
- Dynamic Memory Management NPTEL https://www.youtube.com/watch?v=lkFK2X6qlc0&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=18
- Class and Object NPTEL
 https://www.youtube.com/watch?v=wtuks_GvP4&list=PLmp4ylk-B4KrM9uOEdvP1VFUkU3jNc6D2&index=24
- Access Specifiers NPTEL https://www.youtube.com/watch?v=6ki_W7cXdM0&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=22
- Constructor and Destructor NPTEL https://www.youtubc.com/watch?v=wtuks_f3vP4&list=PLmp4ylk-B4KrM9uOEdvPIVFUkU3jNc6D2&index=24
- C++ different topics from W3School https://www.w3schools.com/CPP/default.asp
- C++ different topics from Javatpoint https://www.javatpoint.com/cpp-tutorial

Assessment (CIA): (By Course Teacher) End Semester Exam Labor A. I B. S C. V Came and Signature of Convention	50 Marks ent (CIA): 15 Marks 35 Marks al Test / Quiz-(2): 10 & 10 ament/Seminar + Attendance - 05 Marks - 15 ratory / Field Skill Performan Performed the Task based on lat Spotting based on tools & techno Viva-voce (based on principle/te	ology (written) – 10 Marks as per lab.
End Semester Exam (ESE): Continuous Internal Assessment (CIA): (By Course Teacher) End Semester Exam Labor A. I B. S. C. Mame and Signature of Convent	35 Marks al Test / Quiz-(2): 10 & 10 ament/Seminar + Attendance - 05 Marks - 15 ratory / Field Skill Performan Performed the Task based on lat Spotting based on tools & techno Viva-voce (based on principle/te	+ obtained marks in Assignment shall be considered against 15 Marks ce: On spot Assessment
Continuous Internal Assessment (CIA): (By Course Teacher) End Semester Exam Labor A. I B. S C. V Sume and Signature of Conventer Assign Total N Course Teacher)	nment/Seminar +Attendance - 05 Marks - 15 ratory / Field Skill Performan Performed the Task based on lal Spotting based on tools & techno Viva-voce (based on principle/te	+ obtained marks in Assignment shall be considered against 15 Marks ce: On spot Assessment
Assessment (CIA): Assign Total M End Semester Exam Labor A. I B. S. C. Mame and Signature of Convence	Marks - 15 ratory / Field Skill Performan Performed the Task based on lat Spotting based on tools & techno Viva-voce (based on principle/te	ce: On spot Assessment b. work - 20 Marks ology (written) - 10 Marks considered against 15 Marks Managed by Course teache as per lab.
End Semester Exam Labor A. 1 B. 8 C. Vame and Signature of Convence	Performed the Task based on fail Spotting based on tools & techno Viva-voce (based on principle/te	ology (written) – 10 Marks as per lab.
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PA	RT- A: Intro	duction			Commence of the Commence of th			
Pro	gram: Bachelor in Co	mouter Applicatio	n					
	tificate / Diploma / Deg			Semester – II	Session: 2021	2025 / -2 6		
	Course Code	CASC -06T			₹3	-		
	Course Title	Data Structure						
1	Course Type	DSC (Discipline	Specific C	nurse)				
4	Prerequisite (if, any)	As per program	ореспи С	ourse)				
	Course Learning Outcomes (CLO) Credit Value	At the end of thi Understand Utilize var Understand Apply stacd Understand	d the fundame ious algorithr ding about da k, Queue, Lis d how various ing language.	s data structures can b	s of data structure lem solving. nputer memory. for real world applicate e used to implement th			
,	Total Marks	Max. Marks:			ng & Observation	0		
ΛI	The state of the s		100	VIII	Passing Marks: 4	0		
_		nt of the Co			5 D . 1 /45 TT			
		ching-Learning	Periods (01	Hr. per period) - 4	5 Periods (45 Hour			
n	it	То	pics (Cour	rse contents)		No. of Period		
	and Nonlinear Data calculations of Arr	Introduction and Basic Concepts: Introduction, Fundamentals of Algorithms, Data types: Primitive. Non-Primitive Absent Data Type (ADT), Classification of Data Structure: Linear and Nonlinear Data Structure. Array: Arrays and its types, Memory allocation and address calculations of Array, Sparse Array. Linked List: Types of Linked List and various Operations Like INSERT, DELETE, TRAVERSE. Introduction and Application of Stack and						
H	Applications of Sta Postfix expression e Queue: Definition,	Stack: Definition, Operations PUSH, POP, Implementations using Array and Linked list. Applications of Stack: Infix, Prefix, Postfix representation and conversion using Stack, Postfix expression evaluation using Stack, Recursion using Stack. Queue: Definition, Types of Queues: Priority Queue, Circular queue, Double Ended Queue, operations of Queue INSERT, DELETE, TRAVERSE, Implementation Queue using Array						
11	Tree: Definition of operations Insertion traversal, Binary Security Definition Representation of a Connectivity of Connectivity of Minimum Spanning	f Trees and their, deletion, searching arch Trees, Implem of Graph and their graphs, Graph Traveraphs, Weighted Tree, Kruskal's an	types, Binar g and traversa entations, AV r types, Adja- ersal – Bread Graphs, Sho d Prim's Alge	cency and Incident (noted that the centre of	post order, in-order natrix & linked list) epth first Traversal, m, Spanning Tree,	11		
ľ	Merge Sort, Radix S	Sort. Searching: Li	near search, I			11		
	ords Data, ADT, Array ne and Signature of Co Ora King Data, New Ork, B. Ouhu	n Linked List, Stack	a. Queue, Tree	Graph, Searching, S	(Dat Join) Sharm)	Khumbey ?		

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PART-C: **Learning Resources**

Text Books, Reference Books and Others

Text Books Recommended:

- Michael T. Goodrich, Data Structures and Algorithms in C++, Wiley
- Horowitz and Sahani, Fundamentals of Data Structures, Computer Science Press

Reference Books Recommended:

- Alfred V. Aho, Data structures and Algorithms, Jhon E. Hopcroft and J.E. Ullman.
- Jean Paul Trembley and Paul Sorenson, An Introduction to Data Structures with Applications, TMH, International Student Edition
- R. Kruse, Leung &Tondo, Data Structures and Program Design in C, PHI publication, 2nd Edition

Online Resources:

- NPTEL YouTube Channel: Data Structure Complete course
- https://youtube.com/playlist?list=PLc2MoXNv7E4mtsPlnn9BnTOENXsGyoDgR&si=aAYaVZvW feuhFEO
- NPTEL YouTube Channel: Introduction to Data Structure
- https://www.youtube.com/watch?v=zWg7U0OEAoE&list=PLBF3763AF2E1C572F&index-1
- NPTEL YouTube Channel: Stacks
- https://www.youtube.com/watch?v=g1USSZVWDsY&list=PLBF3763AF2E1C572F&index=2
- NPTEL YouTube Channel: Queues and linked list
- https://www.youtube.com/watch?v=PGWZUgzDMYI&list=PLBF3763AF2E1C572F&index=3
- NPTEL YouTube Channel: Trees
- https://www.youtube.com/watch?v=tORLeHHtazM&list=PLBF3763AF2E1C572F&index=6
- NPTEL YouTube Channel: Graphs
- https://www.youtube.com/watch?v=9zpSs845wf8&list=PLBF3763AF2E1C572F&index=24
- W3schools Data Structure Reference: DSA Tutorial (w3schools.com)

 W3schools Data St 	ructure Reference: DSA Tutoriai (waschools.com)
PART -D: Assess	ment and Evaluation
Suggested Continuous E Maximum Marks: Continuous Internal As	Evaluation Methods: 100 Marks sessment (CIA): 30 Marks
End Semester Exam (ESE):	Two section – A & B Section A: Q1. Objective – 10 x1= 10 Mark; Q2. Short answer type- 5x4 – 20 Marks Section B: Descriptive answer type qts., tout of 2 from each unit-4x10=40 Marks
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PART		COUNSE	CURRICULUI	¥1		
	A: Intro	duction				
	n: Bachelor in te / Diploma / Do	Computer Application	Semester - II	Session: 2024- 2	025,	
Cour	se Code	CASC-06P				
2 Cour	se Title	Lab 4: Data Structure	Using C++			
Cour	sc Type	Practical				
4 Prere	equisite (if, any)	As per program				
	 Understand the functioning of Array and linked list programmatically. Understand the applications of array, linked list stack, queue, tree and graphogrammatic. Write programs for various data structures for real world application. 					
6 Cred	it Value					
	l Marks			Min Passing Marks:	20	
PART -		nt of the Course				
				20 Pariode (30 Hours)	Commence of the second second second	
	I otal No	. of learning-Training/p	erformance Perious	5. 30 Ferious (30 mours)	No. of	
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traversing using priority queue.

- 17. Write a program to implement the concept of priority-based element traversing using priority queue.
- 18. Write a program to create binary search tree using the concept of linked list and array, suppose data set will be given at the run time.
- 19. Write a program to create a binary tree with any data set and traverse the data items in pre-order, in-order and post-order manner using recursion.
- 20. Write a program to perform deletion of any data item from the binary search tree.
- 21. Write a program to find the height of any tree.
- 22. Write a program to create any given undirected graph using the adjacency matrix, and print each node/element with list of its adjacent elements.
- 23. Write a program to find the height of any given tree.
- 24. Write a program to traverse the element of given graph according BFS and DFS
- 25. Write a program to find the minimum spanning tree of any given graph.
- 26. Write a program to search any run time given element from the array of 10 elements in the array are unsorted.
- 27. Write a program to demonstrate the binary search.
- 28. Write a program to find the smallest and largest element in any array.
- 29. Write a program to arrange the data items of any array in ascending order.
- 30. Write a program to arrange the data items of any array in descending order using quick sort.

Note: Concerned teacher can add additional practical exercises as per requirement.

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PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Michael T. Goodrich, Data Structures and Algorithms in C++, Wiley
- Horowitz and Sahani, Fundamentals of Data Structures, Computer Science Press

Reference Books Recommended:

- Alfred V. Aho, Data structures and Algorithms, Jhon E. Hopcroft and J.E. Ullman.
- Jean Paul Trembley and Paul Sorenson, An Introduction to Data Structures with Applications.
 TMH, International Student Edition
- R. Kruse, Leung &Tondo, Data Structures and Program Design in C, PHI publication. 2nd Edition

Online Resources:

- NPTEL YouTube Channel: Data Structure Complete course https://youtube.com/playlist?list=PLc2MoXNv7E4mtsPlnn9BnTOENXsGvoDgR&si=aAYaVZ-vWfeuhFEO
- NPTEL YouTube Channel: Introduction to Data Structure https://www.youtube.com/watch?v=zWg7U00EAoE&list=PLBF3763AF2E1C572F&index=1
- NPTEL YouTube Channel: Stacks https://www.youtube.com/watch?v=g1USSZVWDsY&list=PLBF3763AF2E1C572F&index=2

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- NPTEL YouTube Channel: Queues and linked list https://www.youtube.com/watch?v=PGWZUgzDMYI&list=PLBF3763AF2E1C572F&index-3
- NPTEL YouTube Channel Trees https://www.youtube.com/watch?v=tORLeHHtazM&list=PLBF3763AF2E1C572F&index=6
- NPTEL YouTube Channel: Graphs https://www.youtube.com/watch?v=9zpSs845wf8&list=PLBF3763AF2E1C572F&index=24

W3schools Data Structure Reference: DSA Tutorial (w3schools.com)

PART -D: Assessment and Evaluation Suggested Continuous Evaluation Methods: 50 Marks Maximum Marks: 15 Marks Continuous Internal Assessment (CIA): 35 Marks End Semester Exam (ESE): Better marks out of the two fest Quiz 10 & 10 Internal Test / Quiz-(2): Continuous Internal + obtained marks in Assignment shall be Assignment/Seminar +Attendance - 05 Assessment (CIA): considered against 15 Marks 15 Total Marks -(By Course Teacher) Managed by Laboratory / Field Skill Performance: On spot Assessment **End Semester** Course teacher as - 20 Marks A. Performed the Task based on lab. work per lab. status Exam (ESE): B. Spotting based on tools & technology (written) - 10 Marks 05 Marks C. Viva-voce (based on principle/technology) Name and Signature of Convener & Members of CBoS: Chewron Or. K.B. Duben

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PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Peter Baer Galvin, Greg Gagne, Operating System Concepts Abraham Silberschatz, 8th edition, Wiley-India, 2009.
- Andrew S. Tanenbaum, Modern Operating Systems, 3rd Edition, PHI
- Elmasri, Carrick, Levine, Operating Systems: A Spiral Approach TMH Edition

Reference Books Recommended:

- · Akshay Singh, Operating System, RGCSM Publications
- Rusell A Stultz, MS DOS 6.22, BPB Publications
- Brain Underdahl, Teach yourself Windows 2000, Wiley Publications.
- · Peter Norton, Maximizing Windows, Teachmedia.
- · Ray Duncan, Advances MS-DOS Programming, BPB
- Ray Yao, Shell Scripting in 8 Hours

Online Resources:

- Fundamentals of Computer, Windows Operating System: https://vikaspedia.in/education/digital-literacy-courses-in-associating-with-msup/computer-fundamentals
- Introduction to Operating System: https://www.w3schools.in/operating-system/tutorials/
- Introduction to Operating System: https://www.javatpoint.com/windows
- Windows: https://www.javatpoint.com/windows
- Linux: https://www.javatpoint.com/what-is-linux
- DOS: https://www.gceksforgeeks.org/ms-dos-operating-system/
- DOS: https://www.javatpoint.com/ms-dos-operating-system

PART -D: Assess	ment and E	valuation	
Suggested Continuous I			
Maximum Marks:		100 Marks	
Continuous Internal As	sessment (CIA):	30 Marks	
End Semester Exam (E	SE):	70 Marks	Chapter Charles Control Contro
Continuous Internal Assessment (CIA): (By Course Teacher)	Internal Test / Qu Assignment / Sen Total Marks -	ninar - 10 30	Better marks out of the two Test / Quiz + obtained marks in Assignment shall be considered against 30 Marks
	Section B: Descrip	ojective – 10 x1= 10 otive answer type qt	Mark; Q2. Short answer type- 5x4 = 20 Marks s.,1 out of 2 from each unit-4x10=40 Marks
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FOUR YEAR UNDERGRADUATE PROGRAM (2024

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Program: B	achelor in Compu	iter Application	Semester -	.1 500	view 2024 26	195
	Diploma / Degree	2)	Semester	. 589	sion: 2024-20 4 5 - 2	26
1 Course Co	ode CA	AGE-02P				1
2 Course Ti	itle La	b 2: Operating Sy	stem			
3 Course T	ype Pro	actical				
4 Prerequisite As per program						
Course L Outcome	Learning es (CLO)	 Understand the Operating System Understand bae Understand fee Understand coe Explore function 	e, the students will be able fundamental conceptem. sics of DOS commands atures of Windows Oper imparative features of Dionality of Linux.	and its types. rating system. OS and Window	ws Operating	systems.
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PART -B:		of the Cour	**************************************	A 1820 - HOLLOW AND		to the second of the second of
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Keywords DOS, Windows, Linux.

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Rusell A Stultz, MS DOS 6 22 BPB Publications
- Brain Underdahl, Teach yourself Windows 2000, Wiley Publications

Reference Books Recommended:

- Peter Norton, Maximizing Windows, Teachmedia.
- Ray Duncan, Advances MS-DOS Programming, BPB
- Akshay Singh, Operating System. RGCSM Publications
- Ray Yao, Shell Scripting in 8 Hours

Online Resources:

- DOS: https://www.javatpoint.com/ms-dos-operating-system
- Windows: https://www.javatpoint.com/windows
- Linux: https://www.javatpoint.com/what-is-linux
- Fundamentals of Computer, Windows Operating System:
 https://vikaspedia.in/education/digital-litercy/it-literacy-courses-in-associating-with-msup/computer-fundamentals
- DOS: https://www.geeksforgeeks.org/ms-dos-operating-system/

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PART -D: Assessme	ent and Evaluati	ion	and the second s	
Suggested Continuous Maximum Marks:	Evaluation Method	is: 50 Marks		
Continuous Internal A	ssessment (CIA):	15 Marks		
End Semester Exam (I	ESE):	35 Marks	Better marks out of the	two Test Quiz
Continuous Internal Assessment (CIA):	Internal Test / Quiz Assignment/Seminar	+Attendance - 05	+ obtained marks in As considered agains	signment shall be it 15 Marks
(By Course Teacher)	Laboratory / Rield	Skill Performand	ce: On spot Assessment	Managed by
End Semester Exam (ESE): Name upd(Signature of	A. Performed the B. Spotting based C Viva-vote (based)	e Task based on lab d on tools & technol sed on principle/tec	logy (written) - 10 Marks	Course teacher as per lab. status
Dr. H.S. Hora Kry	gel y	James J	DV.SSEN	
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- 201 SC C OUG	CASEC-01	and the second s	a degli di manendo arramando de que di) - 16
Course Title	ICT Based Lea	rning				
Course Type	SEC (Skill Enh		Course)			
Prerequisite	As per program		000130)			
Course Learning. Outcomes(CLO)	At the end of this Understate Understate To provide Create do	s course, st nd the cond nd the cond de knowled cument us	cept of ICT. cept of Blended ge about vario ing tools word	l learning. us OER reso		
Credit Value	2 Credits	Credit =1	5 Hours Theo	retical Lear	ning and	
	(1C+1C) = 30 Hours Laboratory or Field Learning/Training					
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	ching- Learning	Periods (01 Hr. per pe	riod) - 30 l	Periods (30 Hou	
A	Topics (Course contents) No. of Perio					
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Google Tools- Go Sheet, Google Slice	oogle Forms, Goo des.	gle Classro	oom, Google N	leet, Google	Docs, Google	30
ds Blended Learning, O	pen Educational	Resource,C	Google.			
nairmen Kily	Jah y	form.	2 Gral	yme June	Sour	Ange ETA
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Meeting Management Tools—Diff Zoom, Skype etc. ds Blended Learning, Open Educational Advantages and Blended Learning Convener & Member 1988.	Course Learning. Outcomes(CLO) At the end of this course, st Understand the cond To provide knowled Create document us Learn about various Credit Value 2 Credits (1C+1C) Total Marks Max. Marks: 50 Topics (Course Total No. of Teaching—Learning Periods (Course) Topics (Course) Topics (Course) 1. ICT in Education: Concept & Importance Provided Learning: Introduction, terminols Advantages and Disadvantages, Benefits of 3. E-Learning and Web Based Learning: Introduction, terminols Advantages and Disadvantages, Benefits of 3. E-Learning and Web Based Learning: Introduction, terminols Advantages and Disadvantages, Benefits of Classroom, EDUSAT. 4. Open Educational Resources: Introduction, terminols OER, OER Tools Like Google Classroom, But Google Tools—MS Word, MS Excel, M Google Tools—Google Forms, Google Classroom, Sheet, Google Slides. Meeting Management Tools—Different Typ Zoom, Skype etc. Blended Learning, Open Educational Resource, Course of CBase Advantages Blended Learning, Open Educational Resource, Capital Signature of Convener & Membacs of CBase Advantages Advantages	At the end of this course, students will be • Understand the concept of ICT. • Understand the concept of Blender • Understand the concept of Blender • To provide knowledge about various Google tools. Credit Value Credits (1C+1C) Total Marks Total Marks Total No. of Teaching—Learning Periods (01 Hr. per periods) Topics (Course contents) I. ICT in Education: Concept & Importance of ICT, Need 2. Blended Learning: Introduction, terminology, types of Introduction, terminology, types of Introduction, EDUSAT. 4. Open Educational Resources: Introduction, Advantages and Disadvantages. Benefits of Blended Learning: Google Tools—Ike Google Classroom, various OER. Presentation Tools—MS Word, MS Excel, MS PowerPoint Google Tools—Google Forms, Google Classroom, Google Needing Management Tools—Different Types of Meeting Zoom, Skype etc. Blended Learning, Open Educational Resource, Google. Advantages All Management Tools—Different Types of Meeting Zoom, Skype etc. Blended Learning, Open Educational Resource, Google. Advantages All Management Tools—Different Types of Meeting Zoom, Skype etc. Blended Learning, Open Educational Resource, Google. Advantages All Management Tools—Different Types of Meeting Zoom, Skype etc. Blended Learning, Open Educational Resource, Google. Advantages All Management Tools—Different Types of Meeting Zoom, Skype etc.	At the end of this course, students will be able to: • Understand the concept of ICT. • Understand the concept of Blended learning. • To provide knowledge about various OER resc. • Create document using tools word, Google Doc. • Learn about various Google tools. Credit Value 2 Credits (IC+IC) Total Marks Max. Marks: 50 Min Pass RT - B: Content of the Course Total No. of Teaching- Learning Periods (01 Hr. per period) - 30 Id. Topics (Course contents) 1. ICT in Education: Concept & Importance of ICT, Need of ICT in E. 2. Blended Learning: Introduction, terminology, types of Blended Learning. 3. E-Learning and Web Based Learning: E-Learning, Web Based Le. Classroom, EDUSAT. 4. Open Educational Resources: Introduction, Advantages & Dis. OER, OER Tools Like Google Classroom, various OER. Presentation Tools - MS Word, MS Excel, MS PowerPoint, WPS Office. Google Tools- Google Forms, Google Classroom, Google Meet, Google Sheet, Google Slides. Meeting Management Tools- Different Types of Meeting Tools Like Zoom, Skype etc. Ms Blended Learning, Open Educational Resource, Google. And The Marks Administration of Convener & Memback of CBaS: Advantages Advantages Administration of CBaS: Advantages Ad	At the end of this course, students will be able to: Understand the concept of ICT Understand the concept of Blended learning To provide knowledge about various OER resources Credit Value Credits (IC+1C) Total Marks Max. Marks: Total No. of Teaching—Learning Periods (01 Hr. per period) - 30 Periods (30 Houts) Topics (Course contents) I. ICT in Education: Concept & Importance of ICT, Need of ICT in Education. Blended Learning: Introduction, terminology, types of Blended Learning Models, Advantages and Disadvantages, Benefits of Blended Learning. B-Learning and Web Based Learning: E-Learning, Web Based Learning, Virtual Classroom, EDUSAT. Open Educational Resources: Introduction, Advantages & Disadvantages of OER, OER Tools Like Google Classroom, various OER. Presentation Tools—MS Word, MS Excel, MS PowerPoint, WPS Office. Google Tools—Google Forms, Google Classroom, Google Meet, Google Docs, Google Sheet, Google Slides. Meeting Management Tools—Different Types of Meeting Tools Like Google Meet, Zoom, Skype etc. Blended Learning, Open Educational Resource, Google. Mind Signature of Convener & Membros of CBas: Meeting Management Tools—Different Types of Meeting Tools Like Google Meet, Zoom, Skype etc. Blended Learning, Open Educational Resource, Google. Mind Signature of Convener & Membros of CBas: Meeting Management Tools—Different Types of Meeting Tools Like Google Meet, Zoom, Skype etc.

PART-C: Learning Resources

Text Books, Reference Books and Others

Text Books Recommended:

- Agarwal J.P. (2013): Modern Educational Technology. Black Prints, Defhi
- Barton, R. (2004). Teaching Secondary Science with ICT. McGraw Hill International

Reference Books Recommended:

- Bhaskar Rao (2013): Samachara Prasara Sankethika vidya Shastramu, Masterminds, Guntur
- Cambridge, D.(2010).E-Portfolios for Lifelong Learning and Assessment. John Wiley and Sons

Online Resources:

- https://www.unesco.org/en/communication-information/open-solutions/open-educational-resources
- National Digital Library of India: https://www.ndl.gov.in/
- SWAYAM PORTAL: https://www.swayam.gov.in
- E-Gyankosh: https://egyankosh.ac.in/

Suggested Continuous Maximum Marks:	Evaluation Methods: 50 Marks		
Continuous Internal As End Semester Exam(ES			
Continuous Internal Assessment(CIA): (By Course Teacher)	Internal Test / Quiz-(2): 10 + 10 Assignment/Seminar- Total Marks - 15	obtained marks in	the two Test / Quiz + Assignment shall be gainst 15 Marks
End Semester Exam (ESE):	Laboratory/Field Skill Performance A. Performed the task based on lea B. Spotting based on tools (Written C. Viva-voce (based on principle/te	rned skill - 20 Marks i) - 10 Marks	Managed by Coordinator as per skilling