ST. ALOYSIUS' COLLEGE(AUTONOMOUS) JABALPUR **PART A: Introduction** Program: Session: 2023-24 Class: B.Sc. Semester: III SEM Diploma Subject: Computer Science (B.Sc.) Course Code 1. S2-COSC1T Computer Networks & Information Security 2. Course Title 3. Major / Minor Course Type Nil 4. Pre-Requisite (if any) After Completing this course students will be able to Course learning Define and describe the components of a data communication system such as • outcome various protocols. OSI Model, data transmission in analog and digital format Identify and differentiate among the network devices and drives Learn and describe various error detection and correction methods. describe the • Various terminologies used in Network and Application layers. Credit Value 5. Theory—4 Credits **Total Marks** 6. Max. Marks: 40+60 Min. Passing Marks: 35

PART B: Content of the Course			
Lectures (in hours per week): 2 Hrs. per week			
	Total No. of Lectures (in hours): 60 Hrs.		
Module	Topics	No. of Lectures	
Ι	Introduction to Computer Network: Use of Computer network: Access to information, person-to-person communication electronic commerce, internet of things. Types of computer networks: Broadband access network, Mobile and wireless network, content delivery network, transit network, Enterprise network. Network Technology: Personal Area Network Local Area Network, Metropolitan Area Network, Wide Area Network, example of network (Internet, Mobile network, wireless network-Wi-Fi); Reference Model: OSI, TCP/IP, Critique of the OSI and TCP/IP reference models. Keywords: Io T Broadband, LAN MAN, WAN, OSI, TCP/IP	12	
Π	Physical Layer: Guided Transmission Media: Twisted pairs, coaxial cable, Fiber Optics; Wireless transmission: The electromagnetic spectrum, frequency hopping spread spectrum, direct sequence, spread spectrum, ultra deb communication; Cellular Network: Common concepts- cells, handoff, 1G 2G,3G,4G & 5G technology. Keywords: Coaxial cable, fiber optics, 2G,3G,4G 5G	12	
III	Data Link Layer: Service Provided to Network Layer: Data Link Control: Framing, Flow and Error Control; Error detecting codes, Error- correcting codes; Data Link Protocols: Basic transmission and receipt, simplex link layer protocol, full duplex, sliding window protocol, Packet over SONET, ADSL, Point-to-Point Protocol. Switching Techniques: Packet Switching, Circuit Switching, Datagram Networks, Virtual- Circuit Networks, and Structure of a Switch. Network Devices & Drivers: Router, Modem, Repeater, Hub, Switch, Bridge and Gateway (fundamental concepts) Keywords: error correcting codes, error detecting codes, So NET, ADSL, point-to-point protocol, Router, Modem, Repeater, Hub, Switch, Bridge, Gateways.	12	
IV	Network Layer: Routing Algorithm: Optimality, Principal of Shortest path algorithm, Flooding, Distance Vector Routing, Broadcast Routing;	12	

	Congestion in network, traffic management approaches; IP addresses, IPv4 Addresses, IP v6 Addresses. Virtual Circuit Networks: Frame relay and ATM, Transport Layer: Process- Process Delivery; UDP, TCP. Application Layers: DNS, SMTP, POP, Ftp, http and https. Basics of Wi-Fi (Fundamental concepts Only).	
V	Network Security and Information Security: Fundamentals of network and information security: principles of security and attack. Security Goals (Confidentiality, Integrity, and Availability). Overview of Security Threats and Vulnerability: Types of attacks on Confidentiality, Integrity and Availability. Vulnerability and Threats: Phishing Attacks, E-mail threats, Web-threats, Intruders and Hackers, Insider threats, SQL injection Attacks, Ransomware. Malware: Worms, Virus Spams, Adware, Spyware, Trojans. Security Technology: Firewalls, intruding detection and prevention systems, Scanning and Analysis Tools: Biometric access controls, Cipher methods, cryptographic algorithms, cryptographic tools. Keywords: phishing, SQL injection, Worms, Computer virus, spyware, Trojans, Firewall, cipher, Cryptography	12

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings

Textbooks:

- Andrew S. J. Wetherall, Computer Networks, 6th Edition,(2021), Pearson.
- J Mattord, Principles of Information Security, Fourth Edition, 6 th Indian Reprint.
- Praveen Kinnar Shur la, Surya Prakash Tripathi, Ritendra Goe 1 "Introduction to Information Security an Cyber Laws", 2014. Dreamtech Press.
- Books published by Hindi Granth Academy, Bhopal

Reference books:

- Kurose James F., Ross Keith W., Computer Networking, A 4 op-Down Approach, Sixth Edition, 2017. Pearson
- Micki Krausc. Harold F. Tipton, Handbook of Information Security Management, Vol. 1-3, CRC Press LLC.
- B. A. Forouzan: Data Communications and Networking. Fourth edition, TMH Publishing Company Ltd.
- Basta W. Halton, Computer Security: Concepts, Issues and Implementation, Cengage Learning India.

Part D-Assessment and Evaluation			
Suggested Continuous	Evaluation Methods: Maximum Marks: 100		
Continuous Comprehe	nsive Evaluation (CCE): 40 marks University Exam (UE) 60 marks		
Internal Assessment	Class Test/Assignment/Presentation	Total 40	
Continuous			
Comprehensive			
Evaluation (CCE)			
External Assessment:	Section(A): Objective Questions University	Total 60	
Exam Section	Section(B): Short Questions		
	Section(C): Long Questions		

ST. ALOYSIUS' COLLEGE(AUTONOMOUS) JABALPUR			
	PART A	: Introduction	
Program: Diploma	Session: 2023-24	Class: B.Sc.	Semester: III SEM
Subject: Compute	r Science (B.Sc.)		
Course Code		S2-COSC 1T	
Course Title		Computer Networks & Information	n Security
Course Type		LAB	
Pre-Requisite	(if any)	Nil	
Course learning outcome Credit Value Total Marks	 After completing lab course stu Learn and identify vario Learn, and identify Var Use various tools for pr Configure and manage Max. Marks: 100 PART B: Configure	dents will be able to: ous cables used in the Net working rious connectors used to connect different reparing the connectors for cables. various local area networks. Practical— 2 Credits Min. Passing Marks: 35	rent cables.
	Lectures (in hours p	per week): 1 Hrs. per week	
Module		ics	No. of Labs.
	 Study of UTP cable Color code of UTP Shielding of n/w ca Maximum length for Crimping of RJ45 or cable Knowledge of Structured C Information Information outlet with box Network Rack (4U, Patch Panel Rack Management Study of Optical Fiber cable Different cores of C Multimode & Singl OFC Splicing/Termination LIU fix LIU management (p Converter. FP module. Rules of OFC layin Use of tools Crimping tool Nose plier Wire stripping and Multi-meter 	cable Categories of UTP n/w cable ble or which data cable can be used connector and punching of data cabling and its components c ble and its components c c (0, 9U, 12U, 24U, 32U, 42U) e DF C (6 core, 12, 24 core) le mode OFC cable Shielding of on of OFC. OTDR Testing pigtail/fiber patchcord) and Media ag cable cutter c of Local Area Network File and printer sharing Installation ent.	30

	 Connect the computers to Local Area Network. Configuring Class, A IP address on LAN Connection in Computer LAB and use the following tools: Ping, ipconfig, getmac, hostname, nslookup, tracert, systeminfo. routing using packet tracer software Dynamic routing using packet tracer Implementation of Subnetting in Class A, B, C Ping between 2 s2'stems using lPv6 	
	Textbooks, Reference Books, Other Resources	
Suggested Reading	gs	
 Textbooks Andrew S. Tane Pearson. Michael E Whit AGE Learning, Books publishet Reference books Hacking Expose Computer Security 	enbaum, Nick Feamster, David J. Wetherall. Computer Nonworks, 6th man and Herbert I Mattord, Principles of Information Security, Fourth 6th Indian Reprint. d by M.P. Hinai Granth Academy, Bhopal. ed, Stuart McClure, Joel Scrambray, Ge urge Kurtz, TMII. rity Art and Science, Matt Bishop, Pearson/PHI. Part D-Assessment and Evaluation ous Evaluation Methods: Maximum Marks: 100	Edition (2021), Edition, CENG
Continuous Compre	ehensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks	
Internal Assessment Continuous Comprehensive Evaluation (CCE)	 Internal Viva: 20 Marks Practical File: 20 Marks 	Total 40
External Assessment University Exam Section	 Practical record file: 20 Marks Viva voce practical: 10 Marks Execution:10 Marks Answer Script: 20 Marks 	Total 60

PART A: Introduction				
Program: Diploma	Session: 2023-24	Class: B.Sc.	Year III SEM	
Subject: Compu	ter Science (B.Sc.)			
Course Code	e	S2-COSC 1T		
Course Title	2	Computer Networks & Informat	ion Security	
Course Type Elective				
Pre-Requisite (if any) Nil				
 After Completing this course students will be able to Define and describe the components of a data communication system such as var protocols. OSI Model, data transmission in analog and digital format Identify and differentiate among the network devices and drives Learn and describe various error detection and correction methods. describe the Various terminologies used in Network and Application layers. 			n system such as various l format lrives ethods. describe the vers.	
Credit	Theory—3 Credits	Practical— 1 Credits		

Value		
19. Total Marks	Max. Marks: 40+60	Min. Passing Marks: 35

PART B: Content of the Course					
Lectures (in hours per week): 2 Hrs. per week					
	Total No. of Lectures (in hours): 45 Hrs.				
Module	Topics	No. of Lectures			
Ι	Introduction to Computer Network: Use of a Computer network: Access to information, person-to-person communication electronic commerce, internet of things. Types of computer networks: Broadband access networks, Mobile and wireless networks, content delivery networks, transit networks, and Enterprise networks. Network Technology: Personal Area Network Local Area Network, Metropolitan Area Network, Wide Area Network, an example of the network (Internet, Mobile network wireless network-Wi-Fi) Reference Model: OSI, TCP/IP, Critique of the OSI and FCP/IP reference models. Keywords: to T Broadband, LAN MAN. WAN, OSI, TCP/IP	12			
II	Physical Layer: Guided Transmission Media: Twisted pairs, coaxial cable, Fiber Optics; wireless transmission: The electromagnetic spectrum, frequency hopping spread spectrum. direct sequence, spread spectrum, ultra deb communication; Cellular Network: Common concepts- cells, handoff; IG 2G,3G,4G & 5G technology. Keywords: Coaxial cable. fiber optics, 2G,.3G,4G,5G.	12			
III	Data Link Layer: Service Provided to Network Layer: Data Link Control Framing, Flow and Error Control; Error detecting codes, Error- correcting codes; Data Link Protocols: Basic transmission and receipt, simplex link layer protocol. full duplex, sliding window protocol, Packet over SONET, ADSL, and Point-to-Point Protocol. Switching Techniques: Packet Switching, Circuit Switching, Datagram Networks. Virtual-Circuit Networks, and Structure of a Switch. Network Devices & Drivers: Router. Modem. Repeater. Hub. Switch, Bridge, and Gateway (fundamental concepts) Keywords: error correcting codes, error detecting codes, So SET, ADSL, point-to-point protocol, Router, Modem, Repeater. Hub, Switch, Bridge, Gateways.	11			
IV	Network Layer: Routing Algorithm: Optimality, Principal of Shortest path algorithm, Flooding, Distance Vector Routing, Broadcast Routing; Congestion in the network, traffic management approaches; IP addresses, IPv4 Addresses, IP v6 Addresses. Virtual Circuit Networks: Frame relay and ATM, Transport Layer Process- Process Delivery: UDP, TCP. Application Layers: DNS, SMTP, POP, FTP, HTTP, and HTTPS. Basics of Wi-Fi (Fundamental concepts Only).	10			

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings

Textbooks:

- Andrew S. J. Wetherall, Computer Networks, 6th Edition,(2021), Pearson.
- J Mattord, Principles of Information Security, Fourth Edition, 6 th Indian Reprint.
- Praveen Kinnar Shur la, Surya Prakash Tripathi, Ritendra Goe 1 "Introduction to Information Security an Cyber Laws", 2014. Dreamtech Press.
- Books published by Hindi Granth Academy, Bhopal

Reference books:

ST. ALOYSIUS' COLLEGE(AUTONOMOUS) JABALPUR				
	PART	A: Introduction		
Program: Diploma	Session: 2023-24	Class: B.Sc.	Semester: IV	
Subject: Compute	er Science (B.Sc.)			
1. Course Code		S2-COSC2T		
2. Course Title		Object Oriented Programming with	Java	
3. Course Type		Major/ Minor		
4. Pre-Requisite	e (if any)	To study this course, a student must completed the course on Programm Certificate Level.	t have successfully ing Methodology at	
5. Course learning outcome	 Course learning outcome Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and functions for developing skills of logic building activity. Identify classes, objects, members of a class and the relationships among them needed for finding the solution to a specific problem. Demonstrates how to achieve re-usability using inheritance, interfaces and packages and describes faster application development can be achieved. Demonstrate, understanding and use of different exception-handling mechanisms and concepts of multi-threading for robust faster and efficient application development. Identify and describe a common abstract user interface. components to design GUI in Java using Applet & Graphics. 			
6. Credit	Theory—4 Credits		~	
7. Total Marks	Max. Marks: 40+60	Min. Passing Marks: 35		

PART B: Content of the Course			
Lectures (in hours per week): 2 Hrs. per week			
	Total No. of Lectures (in hours): 60 Hrs.		
Module	Topics	No. of Lectures	
Ι	History, Java Features. How Java Differs from C and C++, Java and Internet, Java and World Wide Web, Java Supports Systems, Java Environment, Iava Program Structure, Java Tokens. Constants, Variables, Scope of Variable, Data Types, Type Casting, Java Virtual Machine, Command Line, Arguments, Implementing a Java Program.	14	
II	Operators - Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions - Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversions in Expressions. Operator Precedence and Associativity, Mathematical functions. Decision making with if Statement, Simple if Statement, if. Else Statement. Nesting of itselse Statement, if-else Ladder, the Switch statement, The ?: Operator. Loops - While Statement, Do-while Statement, For Statement, Jump in Loops, Labeled Loops.	14	
Ш	Class - Defining a Class, Adding Variables, Adding Methods, Creating Objects, Accessing Class Members, Static Members, Methods- Defining Methods, Nesting of Methods. Method Overloading. Constructors: definition and types, Constructor Overloading. Inheritance - Extending a Class. Overloading Methods, Final Variables and Methods, Final Classes, Finalize Methods, Abstract Methods and Classes, Visibility Control. Arrays: One and two Dimensional Array, Strings. Vectors. Wrapper Class.	14	
IV	Interface- Defining Interfaces, Extending Interfaces, Implementing Interfaces. Accessing Interface Variables. Packages - Using System Packages, Naming Conventions, Creating Packages, Accessing a Package, Using a Package. Adding a Class to a Package. and hiding Classes. Multithreading Creating Threads. Extending the Thread Class, Life Cycle of a Thread. Implement the Runnable interface. Exceptions Handling: try, catch, finally.	14	
V	Applets - building Applet Code, Applet Life Cycle, Applet Tag, Passing Parameters to Applets, Getting Input from the user. Applet Graphics Methods: drawstring, drawRect, fillRect, drawOval, fillOval, drawLine, drawImage, drawArc, fillArc, setColor, setFont. Concept of Stream - Stream C lasses, Byte Stream Classes, Character Stream Classes.	14	

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings

Text Books

• E Balguruswami, Programming with Java, Tata McGrnw-Hill Publication.

Reference Books

- Bruce Eckel, Thinking in Java.
- Herbert Schildt Java: The Complete Reference.
- Y. Daniel Liang, Introduction to Java Programming.
- Paul Deitel, Harvey Deitel, Java: How To Program.
- Cay S. Horsttnann, Core Java Volume I Fundamentals .
- Java Projects, BPB Publication.
- Dr. S.S. Kandare, Programming in Java, S Chand Publication.
- Books published by M.P. Hindi Granth Academy, Bhopal

Suggestive digital platform web links

- https://www.cs.cmu.edu/afs/cs.cniu.edu/usei/gclien/www/down1oad/java/LeainJava.pdf
- https://www.tutorialspoint.confjava/java tutorial.pdf
- httns://www.youtube.com/watch=7soxDfdgtDw
- http:ljwww.mphindigranthaca_gemy.org/
- Suggested equivalent on line courses : https://nptel.ac.in/courses/106/105/106105191/

	Part D-Assessment and Evaluation				
Suggested Continuou	s Evaluation Methods: Maximum Marks: 100				
Continuous Compreh	ensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks				
Internal	Class Test/Assignment/Presentation and Other	Total 40			
Assessment					
Continuous					
Comprehensive					
Evaluation					
(CCE)					
External	Section (A) : Objective Questions	Total 60			
Assessment	Section (B): Short Questions				
University Exam	Section (C): Long Questions				
Section					

ST. ALOYSIUS' COLLEGE(AUTONOMOUS) JABALPUR				
	PART A:	Introduction		
Program: Diploma	Session: 2023-24	Class: B.Sc.	Semester: IV	
Subject: Computer S	Science (B.Sc.)			
8. Course Code		S2-COSC2P		
9. Course Title		Object Oriented Programming with Jav	a	
10. Course Type		LAB		
11. Pre-Requisite (it	f any)	To study this course, a student must ha completed the course on Programming Certificate Level.	ve successfully Methodology at	
12. Course learning outcome	 After the completion of this course, will be able to do the following: Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and functions for developing skills of logical building activity. Identify classes, objects, members of a class and the relationships among them needed for finding the solution to a specific problem. Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved. Demonstrate, understanding and use of different exception-handling mechanisms and concepts of multi-threading for robust faster and efficient application development. Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with a response to events. Identify, Design & Develop complex Graphical user Interfaces using principal Level 			
13. Credit Value		Practical— 2 Credits		
14. Total Marks	Max. Marks: 100	Min. Passing Marks: 35		
	PART B: Con Lectures (in hours pe	tent of the Course er week): 1 Hrs. per week		
	Total No. of Lectu	ares (in hours): 30 Hrs.		
Module	То	opics	No. of Labs.	
	 (Using any Text editor: Notepa Find a greater number conditional operator. Find the factorial of the user using the comman Write a program to che Write a program to dis Write a program to pri Enter a no. and check Write a Program to dis arrays. Write a program to dis array. Write a program to dis obtained by the studen Write a program to calculate a greater than or equal to otherwise 1000 and prior 	ad/Eclipse/Netbeans/ Sublime etc.) between two numbers -using a a number, the number is given by the nd line argument. eck if a number is prime or not. splay tables from 2 to I 0. and the Fibonacci series. whether it is even or odd. ad the sum & average of 10 no. using splay the reverse of a digit no. using an monstrate function overloading. splay grades according to the marks at. lculate the salary of an employee if or equal to 20000 and year of service is to 5 years then bonus will be 2000 int grass salary of	20	

		1	
	 employee. Write a program to convert the given no. of days into months, days using classes, objects and Method. Write a program to convert given string into Uppercase and lowercase and get the length of string using array. Create a package called "Arithmetic" that contains methods to deal all arithmetic operations. Also write a program to use the package. Write a program to demonstrate use of constructor and destructor. Define an exception called "Marks out of Bound" exception that is thrown if the entered marks are greater than 100. Write a program using the application of single inheritance. Find the area of the rectangle & volume of a cube. Develop a simple real-life application to illustrate the use of multithreading. Write a napplet program to draw a Rectangle (color= orange) and a right-aligned oval. Develop an applet that receives 3 numeric values as inputs from the user and then displays the largest no. on the screen. Write a Java Program to merge two files into a third file Write a Java Program to merge the file put Stream class to multive a super super to the screen. 		
	read binary data from any image file.		
	PART C: Learning Resources		
	Textbooks, Reference Books, Other Resources		
Suggested Readings			
 Textbooks: E Balguruswami, Books published Reference Books Bruce Eckel, Thi Herbert Schildt, . Y. Daniel Liang, 	Programming with Java, Tata McGraw-Hill Publication, 2nd Edition by M.P. Hindi Granth Academy, Bhopal - inking in Java (4e) lava: The Complete Reference (9e) Introduction to Java Programming (10e)		
• Paul Dejtel, Harv	ey Dcitel, Java: How To Program (10e)		
Cay S. Horstman	n, Core Java Volume 1 -Fundamentals (10e)		
Java Projects, BP	B Publication.		
Suggestive digital pla	tform web links		
 <u>https://www.cs.ct1iu.cdu/aJs/cs.cniu.edu/user/*etten/www/clowrload/java/LeainJava.pdf</u> 			
https://www.tutorialspoil1t.com/iava/java_tutorial.pdf			
https://www.vout	ube.com/watch?v=7soxDfdgfDwhttp://www.mphindigranthacademy.org	g/	
	Part D-Assessment and Evaluation		
Suggested Continuou	s Evaluation Methods: Maximum Marks: 100		
Continuous Compreh	ensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks		
Internal Assessment	• Internal Viva: 20 Marks	Total 40	
Continuous	• Practical File: 20 Marks		

Comprehensive Evaluation

(CCE)		
External Assessment University Exam Section	 Practical record file: 20 Marks Viva voce practical: 10 Marks Execution:10 Marks Answer Script: 20 Marks 	Total 60

ST. ALOYSIUS' COLLEGE(AUTONOMOUS) JABALPUR				
	PART A: Introduction			
Program: Diploma	Session: 2023-24	Class: B.Sc.	Semester: IV	
Subject: Compute	er Science (B.Sc.)			
1. Course Code				
2. Course Title		Object Oriented Programming with Java		
3. Course Type		Elective		
4. Pre-Requisite (if any) To study this course, a student must have success completed the course on Programming Methodol Certificate Level.		have successfully ing Methodology at		
5. Course learning outcome	 Implement Object Oriento Structures, strings and fur Identify classes, objects, in needed for finding the sol Demonstrates how to ach and describes faster appli Demonstrate, understandia and concepts of multi-through development. Identify and describe a consistent of in Java using Applet & G Identify, Design & Devel 	plement Object Oriented programming concept using basic syntaxes of control uctures, strings and functions for developing skills of logic building activity. ntify classes, objects, members of a class and the relationships among them eded for finding the solution to a specific problem. monstrates how to achieve re-usability using inheritance, interfaces and packages I describes faster application development can be achieved. monstrate, understanding and use of different exception-handling mechanisms I concepts of multi-threading for robust faster and efficient application /elopment. ntify and describe a common abstract user interface. components to design GUI Java using Applet & Graphics.		
6. Credit	Theory—3 Credits			
7. Total Marks	Max. Marks: 40+60	Min. Passing Marks: 35		

PART B: Content of the Course			
Lectures (in hours per week): 2 Hrs. per week			
Total No. of Lectures (in hours): 60 Hrs.			
Module	Topics	No. of Lectures	
Ι	History, Java Features. How Java Differs from C and C++, Java and Internet, Java and World Wide Web, Java Supports Systems, Java Environment, lava Program Structure, Java Tokens. Constants, Variables, Scope of Variable, Data Types, Type Casting, Java Virtual Machine, Command Line, Arguments, Implementing a Java Program.	14	
Π	Operators - Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions - Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversions in Expressions. Operator Precedence and Associativity, Mathematical functions. Decision making with if Statement, Simple if Statement, if. Else Statement. Nesting of ifelse Statement, if-else Ladder, the Switch statement, The ?: Operator. Loops - While Statement, Do-while Statement, For Statement, Jump in Loops, Labeled Loops.	14	
III	Class - Defining a Class, Adding Variables, Adding Methods, Creating Objects, Accessing Class Members, Static Members, Methods- Defining Methods, Nesting of Methods. Method Overloading. Constructors: definition and types, Constructor Overloading. Inheritance - Extending a Class. Overloading Methods, Final Variables and Methods, Final Classes, Finalize Methods, Abstract Methods and Classes, Visibility Control. Arrays: One and two Dimensional Array, Strings. Vectors. Wrapper Class.	14	
IV	Interface- Defining Interfaces, Extending Interfaces, Implementing Interfaces. Accessing Interface Variables. Packages - Using System Packages, Naming Conventions, Creating Packages, Accessing a Package, Using a Package. Adding a Class to a Package. and hiding Classes. Multithreading Creating Threads. Extending the Thread Class, Life Cycle of a Thread. Implement the Runnable interface. Exceptions Handling: try, catch, finally.	14	

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings

Text Books

• E Balguruswami, Programming with Java, Tata McGrnw-Hill Publication.

Reference Books

- Bruce Eckel, Thinking in Java.
- Herbert Schildt Java: The Complete Reference.
- Y. Daniel Liang, Introduction to Java Programming.
- Paul Deitel, Harvey Deitel, Java: How To Program.
- Cay S. Horsttnann, Core Java Volume I Fundamentals .
- Java Projects, BPB Publication.
- Dr. S.S. Kandare, Programming in Java, S Chand Publication.
- Books published by M.P. Hindi Granth Academy, Bhopal

Suggestive digital platform web links

- https://www.cs.cmu.edu/afs/cs.cniu.edu/usei/gclien/www/down1oad/java/LeainJava.pdf
- https://www.tutorialspoint.confjava/java tutorial.pdf
- httns://www.youtube.com/watch=7soxDfdgtDw
- http:ljwww.mphindigranthaca_gemy.org/

• Suggested equivalent on line courses : https://nptel.ac.in/courses/106/105/106105191/

Part D-Assessment and Evaluation		
Suggested Continuou	s Evaluation Methods: Maximum Marks: 100	
Continuous Comprehensive Evaluation (CCE): 40 marks University Exam (UE) 60 marks		
Internal	Class Test/Assignment/Presentation and Other	Total 40
Assessment		
Continuous		
Comprehensive		
Evaluation		
(CCE)		
External	Section (A): Objective Questions	Total 60
Assessment	Section (B): Short Questions	
University Exam	Section (C): Long Questions	
Section		

ST. ALOYSIUS' COLLEGE(AUTONOMOUS) JABALPUR			
PART A: Introduction			
Program: Diploma	Session: 2023-24	Class: B.Sc. IV Semester	Semester: IV
Subject: Computer	Science (B.Sc.)		
8. Course Code			
9. Course Title		Object Oriented Programming with Java	
10. Course Type		Elective	
11. Pre-Requisite	(if any)	To study this course, a student must have su completed the course on Programming Me Certificate Level.	accessfully thodology at
12. Course learning outcome	 Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and functions for developing skills of logical building activity. Identify classes, objects, members of a class and the relationships among them needed for finding the solution to a specific problem. Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved. Demonstrate, understanding and use of different exception-handling mechanisms and concepts of multi-threading for robust faster and efficient application development. Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with a response to events. Identify, Design & Develop complex Graphical user Interfaces using principal 		
13. Credit Value	Java.	Practical— 1 Credits	
14. Total Marks	Max. Marks: 100	Min. Passing Marks: 35	
	PART B: Cont	tent of the Course	
	Lectures (in hours pe	er week): I Hrs. per week	
	Total No. of Lectu	ures (in hours): 30 Hrs.	
Module	T	opics	No. of Labs.
	 Find a greater number by operator. Find the factorial of the using the command line Write a program to check Write a program to disp Write a program to print Enter a no. and check w Write a Program to find Write a program to disp Write a program to calc greater than or equal to 5 years then bo 	e number, the number is given by the user argument. Ek if a number is prime or not. lay tables from 2 to I 0. t the Fibonacci series. hether it is even or odd. the sum & average of 10 no. using arrays. lay the reverse of a digit no. using an array. onstrate function overloading. lay grades according to the marks obtained ulate the salary of an employee if salary is 20000 and year of service is greater than or mus will be 2000 otherwise 1000 and print	20

	• Write a program to convert the given no. of days into months, days		
	• write a program to convert the given no. of days into months, days		
	using classes, objects and Method.		
	• write a program to convert given string into Uppercase and		
	lowercase and get the length of string using array.		
	• Create a package called "Arithmetic" that contains methods to deal		
	all arithmetic operations. Also write a program to use the package.		
	• Write a program to demonstrate use of constructor and destructor.		
	• Define an exception called "Marks out of Bound" exception that is		
	thrown if the entered marks are greater than 100.		
	• Write a program using the application of single inheritance. Find		
	the area of the rectangle & volume of a cube.		
	• Develop a simple real-life application to illustrate the use of multithreading.		
	• Write a program using multiple inheritances to calculate the area		
	and perimeter of a circle using the interface.		
	• Write an applet program to draw a Rectangle (color= orange) and a		
	right-aligned oval.		
	• Develop an applet that receives 3 numeric values as inputs from		
	the user and then displays the largest no. on the screen.		
	• Write a Java Program to read data from the inputted text file name.		
	and print its content on the console.		
	• Write a Java Program to merge two files into a third file		
	Write a Java program to delete duplicate lines in a text file		
	• Write a Java Program to implement FileInputStream class to read		
	binary data from any image file		
	PART C. Learning Resources		
Textbooks Reference Books Other Resources			
Suggested Peoding	Textbooks, Reference Dooks, other Resources		
Touthooluge	33		
F Balguruswam	i Programming with Java Tata McGraw Hill Publication 2nd Edition		
 Books published 	d by M P Hindi Granth Academy Bhonal		
Reference Book	is -		
• Bruce Eckel, T	hinking in Java (4e)		
• Herbert Schildt,	.lava: The Complete Reference (9e)		
• Y. Daniel Liang	, Introduction to Java Programming (10e)		
Paul Dejtel, Har	rvey Dcitel, Java: How To Program (10e)		
Cay S. Horsttna	nn, Core Java Volume 1 -Fundamentals (10e)		
• Java Projects, B	PB Publication.		
• Dr. S.S. Kandar	e, Programming in Java, S Chand Publication		
• https://www.cs	ationii web iiiks ctliu cdu/als/cs cniu edu/user/*etten/www/clowrload/iaya/LeainIaya.pdf		
 https://www.tute 	orialspoillt.com/iava/iava_tutorial.pdf		
 https://www.voi 	utube.com/watch?v=7soxDfdgfDwhttp://www.mphindigranthacademv.org/		
•			
	Part D-Assessment and Evaluation		
Suggested Continuo	us Evaluation Methods: Maximum Marks: 100		
Continuous Compre	hencive Evaluation (CCE): 40 marks University Evam (UE) 60 marks		
Internal	Interest View 20 Ma 1	Total 40	
mernai	• Internal VIVa: 20 Marks	10tal 40	
Assessment	Prostigal File: 20 Marks		

Continuous Comprehensive Evaluation (CCE)		
External Assessment University Exam Section	 Practical record file: 20 Marks Viva voce practical: 10 Marks Execution:10 Marks Answer Script: 20 Marks 	Total 60