ST. ALOYSIUS COLLEGE (AUTONOMOUS), JABALPUR

PART A: Introduction

Program : Diploma	Class: B.Sc.	Year: II Year	Session : 2022-23
Subject: Computer Science			
1	Course Code	S2-COSC1T	
2	Course Title	Computer Networks & Information Security	
3	Course Type Core Course/Elective/Generic Elective/Vocational	Core Course (Major-I)	
4	Pre-Requisite (if any)	Nil	
5	Course Learning Outcomes (CLO)	**After Completing this course student will be able to** 1. Define and describe the components of date communication system such various protocols, OSI Model, date transmission in analog and digital format 2.Identify and differentiate among the network devices and drives 3. Learn and describe various error detection and correction methods. describe the Various terminologies used in Network and Application layers.	
6	Credit Value	Theory- 4 Credits Practical-2 Credits	
7	Total Marks	Max. Marks: 30+70 Min Passing Marks: 35	

PART B : Content of the Course

No of Lectures (In hours per week) 4 Hrs. per week

Total No. of Lectures in Hours) 60 Hrs.

Module	Topics	No of Lectures
I	Introduction to Computer Network: **Use of Computer network**: Access to information, person to person communication electronic commerce, internet of things. **Types of computer network:** 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
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, 1G 2G,3G,4G & 5G technology. **Keywords:** Coaxial cable, fiber optics, 2G,3G,4G 5G	**12**
III	**Date Link Layer:** **Service Provided to Network Layer:** Data Link Control: Framing , Flow and Error Control; Error detecting codes, Error correcting codes; **Date 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's (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; 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) .	**12**

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, Ransom ware. **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, 6th Indian Reprint. o Praveen Kumar Shukla, Surya Prakash Tripathi, Ritendra Goel "Introduction to Information Security an Cyber Laws", 2014, Dreamtech Press. • Books published by M.P. Hindi Granth Academy, Bhopal **Reference books:** • Kurose James F., Ross Keith W., Computer Networking, A Top-Down Approach, Sixth Edition, 2017, Pearon • Micki Krause, 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.
Suggestive digital web links platform
1. https//www.youtube.coin/watch?qiOR5rTSsliw 2. Free CCNA | Network Fundamentals - Day 1 (https://www.youtube.com/watch?Dlo-aM-2s) 3. Free CCNA | Network Deviceslittps://www.youtube.com/watch?v=H8W9oM NSuwo 4. Free CCNA | OSI Model & TCP/IP Suite (https://www.voutube.com/watch? -ai8JzliHu„Y) 5. Free CCNA | Interfaces and Cables | Day3 (https://we.youtube.com/watcli?v=ieTH5lVhNaY) 6. Free CCNA | Intro to the CLI | Day 4 (httns://www.voutube.confwatch?v=IYbtai7Nu2q) Free CCNA | Ethernet LAN Switching (Part 1) | Day 5(https://www.voutube.com/watc1i?mm+n70Vo
Suggested equivalent online course
NPTEL: 1. Demystifying Networking (04 weks) 2. Cyber Security (15 Weeks), https://www.edx.ore/learifcoinputer-networking

Part D- Assessment and Evaluation		
Suggested Continoues Evaluation Methods: **Max Marks :- 100** **Continuous'Comprehensive Evaluation (CCE) : 30 marks University Exam (UE) : 70marks**		
Internal Assessment Continuous'Comprehensive Evaluation(CCE):30	Class Test Assignment/Presentation	Total 30
External Assessment : Exam Section: 70 Hours	Section(A) : Objective QuestionsUniversity Section (B) : Short Questions Time : 03.00 Section (C) : Long Questions	Total 70

PART A: Introduction

Program : Diploma	**Class: B.Sc.**	**Year: II Year**	**Session : 2022-23**

Subject: Computer Science

1.	Course Code	S2-COSC1P	
2.	Course Title	Computer Networks **Lab**	
3.	Course Type (Core Course/ Elective/ Generic Elective/ Vocational	Core Course - (Major — I)	
4.	Pre-Requisite (if any)	Open for all	
5.	Course Learning Outcomes (CLO)	After completing lab course,-sudedts will be able to: 1. Learn and identify various cables used in the Networking 2. Learn, identify Various connectors used to connectdifferent cables. 3. Use the various tools for preparing the connectors for cables. 4. Configure and manage various local area networks.	
6.	Credit Value	Practical's 2 Credit	
7.	Total Marks	Max marks s **100**	Min. **Passing Marks: 35**

PART B: Content of the Course

No. of Lab. Practical's (Shots per week): 1 Hr. per week

Total No. of Labs: 30 Hrs.		
	Suggestive List of Practical's	No. of Labs.
	1. Study of UTP cable o Color code of UTP cable o Categories of UTP n/w cable o Shielding of n/w cable o Maximum length for which data cable can be used Crimping of RJ45 connector and Punching of data n/wcable **2. Knowledge of Structured Cabling and its components Information** Information outlet with box o Network Rack (4U, 6U, 9U, 12U, 24U, 32U, 42U) o Patch Panel o Rack Management 3. Study of **Optical Fiber** cable • Different cores of OFC (6 core, 12, 24 core) • Multimode & Single mode OFC cable • Shielding of OFC • Splicing/Termination of OFC. • OTDR Testing • LIU fixing • LIU management (pigtail/fiber patchcord) • Media Convertor ▪ SFP module ▪ Rules of OFC laying 4. Use of tools • Crimping tool • Punching tool • Nose plier • Wire stripping and cable cutter • Multi-meter 5. **Configuration/management Local Area Network** ▪ Implementation of File and printer sharing ▪ Installation of ftp server and client	30

	▪ Connect the computers in Local Area Network. ▪ Configuring Class A IP address on LAN Connection inComputer LAB and use 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 and C • Ping between 2 systems using IPv6	

PART C: Learning Resources

Textbooks, Reference Books, Other Resources

Suggested Readings

- Andrew S. Tanenbaum, Nick Feamster, David J. Wetherall, Computer Networks, 6th Edition,(2021), Pearson.
- Michael E Whitman and Herbert I Mattord, Principles of Information Security, Fourth Edition, CENGAGE Learning, 6th Indian Reprint.
- Books published by M.P. Hindi Granth Academy, Bhopal

Reference books

- Hacking Exposed, Stuart McClure, Joel Scrambray, George Kurtz, TMH.
- Computer Security Art and Science, Matt Bishop, Pearson/PHI. .

Suggestive digital platform web links

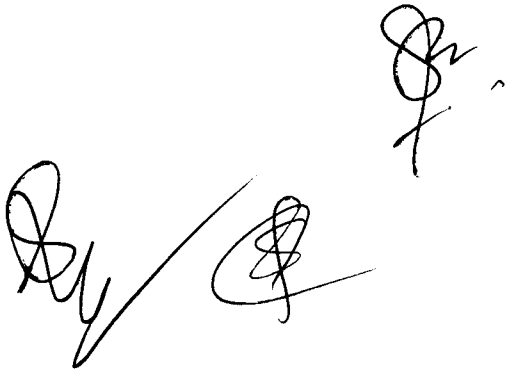
https://www.edx.or%lCdNfcomputei-networkinq•
http://www.iiii»1iindiqoant1iacademv.ore/

Suggested equivalent online courses

https://nptel.ac.in/courses/106/105/106105081/

PART D-Assessment and Evaluation

Internal Assessment : Continuous Comprehensive Evaluation (CCE) : 30 **Marks**		**External Assessment**: University Exam (UE) : **70 Marks** Time : **02.00 Hours**	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Lab Attendance	05 Marks	Practical record file	30 Marks
		Viva voce practical	10 Marks
Internal Viva	10 Marks	Execution	10 Marks
Practical File	15 Marks	Answer script	20 Marks
Total	**30 Marks**	**Total**	**70 Marks**



ST. ALOYSIUS COLLEGE (AUTONOMOUS), JABALPUR

PART A: Introduction

Program: **Diploma**	Class: B.Sc.	Year: II Year	Session: **2022-23**

Subject: Computer Science

1.	Course Code	**S2-COSC2T**	
2.	Course Title	**Object Oriented Programming with Java**	
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	Core Course — (Major — II) / Minor / Elective	
4.	Pre-Requisite (if any)	To study this course, a student must have successfully completed the course on Programming Methodology at Certificate Level.	
5.	Course Learning Outcomes (CLO)	**After the completion of this course, a successful student will be** able to do the **following:** 1. Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity. 2. Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to a specific problem. 3. Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved. 4. Demonstrate understanding and use of different exception handling mechanisms and concepts of multi-threading for robust faster and efficient application development. 5. Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events. 6. Identify, Design & Develop complex Graphical user interfaces using principal Java Swing classes based on MVC architecture.	
6.	Credit Value	**Theory - 4 Credits Practical — 2 Credits**	
7.	Total Marks	Max. Marks: **30+70**	Min. Passing Marks: 35

PART B: Content of the Course

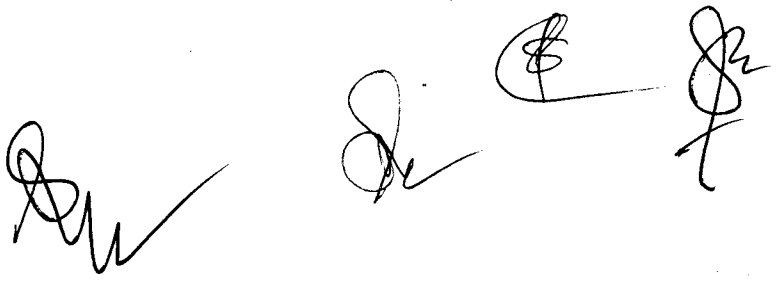
No. of Lectures (in hours per week): 4 **Hrs. per** week

Total No. of Lectures: **60 Hrs.**

Module	**Topics**	**No. of Lectures**

I	History, Java Features, How Java Differs from C and C++, Java and internet, Java and World Wide Web, Java Supports Systems, Java Environment, Java Program Structure, Java Tokens, Constants, Variables, Scope of Variable, Data Types, Type Casting, Java Virtual Machine, Command Line Arguments, Implementing a Java Program,	12
II	**Operators** - Arithmetic Operator, 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 if...else Statement, if-else Ladder, The Switch Statement, The ?: Operator. **Loops** - While Statement, Do-while Statement, For Statement, Jump in Loops, Labeled Loops.	12
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 Classes. **Interface**- Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables.	12

IV	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, Stopping and Blocking Threads, Life Cycle of a Thread, Using Threads Methods, Threads Priority, Synchronization, Implementing the 'Runnable' interface. **Types of Errors** - Exceptions, Syntax of Exception Handling Code, Multiple Catch Statements, Using Finally Statements, Throwing Our Own Exceptions. **Applets** - Building Applet Code, Applet Life Cycle, Applet Tag, Adding Applet to HTML File, Running the Applet. Passing Parameters to Applets, Aligning the Display, More About HTML Tags, and Getting Input from the user.	t2
V	**The Graphics Class** - Lines and Rectangles, Circles and Ellipses, Drawing Arcs, Drawing Polygons, Using Control Loops in Applets, Drawing Bar Charts. **Concept of** Stream - Stream Classes, Byte Stream Classes, Character Stream Classes. **Other Useful I/O Classes** - Using the File Class, Input / Output Exceptions, Creation of Files, Reading / Writing Characters, Reading / Writing Bytes, Handing Primitive Data Types, Concatenating and Buffering Files, Random Access, Files, Interactive Input and Output.	12



PART C: Learning Resources
Textbooks, Reference Books, Other Resources
Suggested Readings
Textbooks -- E Balguruswami, Programming with Java, Tata McGraw-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
littys://www.cs.cmu.edu/afs/cs.cniu.edu/usei/qc1ien/www/doum1oad/java/LeainJava.pdf https://www.tutoria1spoint.confjava/java_tutorial.pdf https://www.youtube.com/watc1i?v=7soxDfdqfDw http://www.mphindigranthacademy.org/
Suggested equivalent online courses
httns://nptel.ac.in/courses/106/105/106105191/

Part D- Assessment and Evaluation		
Suggested Continoues Evaluation Methods: **Max Marks :- 100** **Continuous'Comprehensive Evaluation (CCE) : 30 marks University Exam (UE) : 70marks**		
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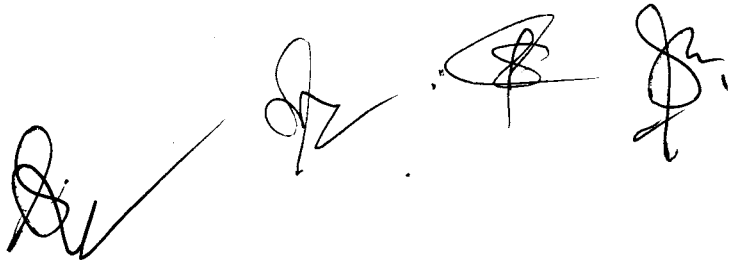
PART A: Introduction			
Program: **Diploma**	Class: B.Sc.	Year: II Year	Session: **2022-23**
Subject: Computer Science			

1.	Course Code	**S2-COSC2P**	
2.	Course Title	**Java Programming Lab**	
3.	Course Type (Core Course/Elective/Generic Elective/ Vocational	Core Course - (Major- II) / Minor / Elective	
4.	Pre-Requisite (if any)	To study this course, a student must have successfully completed the course on Programming Methodology at Certificate Level.	
5.	Course Learning Outcomes(CLO)	**After the completion** of **this** course, **a successful student** will be **able to do the following:** 1. Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity. 2. Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to a specific problem. 3. Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved. 4. Demonstrate understanding and use of different exception handling mechanisms and concepts of multi-threading for robust faster and efficient application development. 5. Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events. 6. Identify, Design & Develop complex Graphical user interfaces using principal Java Swing classes based on MVC architecture.	
6.	Credit Value	**Practical** — 2 **Credits**	
7.	Total Marks	Max. Marks : **100**	Min. Passing Marks: 35

PART B: Content of the Course		
No. of Lab. Practicals (in hours per week): 1 **Ilr.** per week		
Total No. of Lab.: **30 Hrs.**		
	Suggestive List of Practicals	**No. of Labs.**
	(Using any Text editor: Notepad/Eclipse/Netbeans/Sublime etc.) 1. Find greater number between two numbers -using conditional operator. 2. Find the factorial of number if number is given by user using command line argument. 3. Write a program to check if a number is prime or not. 4. Write a program to display tables from 2 to 10. 5. Write a program to print Fibonacci series. 6. Enter a no. and check whether it is even or odd. 7. Write a Program to find sum & average of 10 no. using arrays. 8. Write a program to display reverse of a digit no. using array. 9. Write a program to demonstrate function overloading. 10. Write a program to display grade according to the marks obtained by the student. 11. Write a program to calculate the salary of an employee if salary is greater than or equal to 20000 and year of service is greater than or equal to 5 years then bonus will be 2000 otherwise 1000 and print grass salary of employee. 12. Write a program to convert the given no. of days into months & days using with classes, objects and method. 13. Write a program to convert given string into Uppercase and lowercase and get the length of string using array. 14. Create a package called "Arithmetic" that contains methods to deal all arithmetic operations. Also write a program to use the package. 15. Write a program to demonstrate use of constructor and destructor. 16. Define an exception called "Marks out of Bound" exception that is thrown if the entered marks are greater than 100. 17. Write a program using application of single inheritance. Find the area of rectangle & volume of cube. 18. Develop a simple real life application to illustrate the use of multithreading. 19. Write a program using multiple inheritances to calculate area and perimeter of a circle using interface. 20. Write an applet program to draw a Rectangle (color = orange) and a	30



	right aligned oval. 21. Develop an applet that receives 3 numeric values as inputs from the user and then displays the largest no. on the screen. 22. Write a Java Program to read data from the inputted text file name, and print its content on the console. 23. Write a Java Program to merge two files into third file 24. Write a Java program to delete duplicate lines in text file 25. 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 Readings

Textbooks -

- E Balguruswami, Programming with Java, Tata McGraw-Hill Publication, 2nd Edition
- Books published by M.P. Hindi Granth Academy, Bhopal

Reference Books -

- Bruce Eckel, Thinking in Java (4e)
- Herbert Schildt, Java: The Complete Reference (9e)
- Y. Daniel Liang, Introduction to Java Programming (10e)
- Paul Deitel, Harvey Deitel, Java: How To Program (10e)
- Cay S. Horsttnann, Core Java Volume I -Fundamentals (10e)
- Java Projects, BPB Publication.
- Dr. S.S. Kandare, Programming in Java, S Chand Publication

Suggestive digital platform web liaks

https://www.cs.cniu.edu/afs/cs.cniu.edu/user/*etten/www/clowrload/java/LeainJava.pdf
littps://www.tutorialspoint.com/java/java_tutorial.pdf
littps://www.youtube.com/watch?v=7soxDfdqfDw http://www.mphindigranthacademy.org/

Suggested equivalent online courses

https://npte1.ac.in/courses/106/105/106105191/

PART D-Assessment and Evaluation

Internal Assessment : Continuous Comprehensive Evaluation (CCE) : 30 **Marks**		**External Assessment**: University Exam (UE) : **70 Marks** Time : **02.00 Hours**	
Internal Assessment	**Marks**	**External Assessment**	**Marks**
Lab Attendance	05 Marks	Practical record file	30 Marks
		Viva voce practical	10 Marks
Internal Viva	10 Marks	Execution	10 Marks
Practical File	15 Marks	Answer script	20 Marks
Total	**30 Marks**	**Total**	**70 Marks**