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Approved by AICTE & affiliated to MaulanaAbulKalam Azad University of Technology, West Bengal

243 G.T. Road (N), Liluah, Howrah- 711204, West Bengal, India

Curriculum for Undergraduate Degree (B. Voc.) in Software Development (w.e.f. AY: 2022-23)

Part III: Detailed Curriculum

Third Semester (Second Year)

Course Name:	**Object Oriented Technology with Java**		
Course Code:	BSD301		
Semester:	Third	**Credit:**	3
L-T-P:	3-0-0	**Pre-Requisites:**	
Full Marks:	50		
Examination Scheme:	Semester Examination: 35	Continuous Assessment:10	Attendance: 05

Course Objectives:	
1	To build software development skills using java programming for real-world applications.
2.	To understand and apply the concepts of classes, packages, interfaces, array list, exception handling and file processing.
3.	To develop applications using generic programming and event handling.

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1	**Object Oriented Programming with Java:** Object Oriented Programming, Difference between OOP and another conventional programming – advantages and disadvantages. Features of OOPS, Class and Object, Access modifiers, **Basics of Java:** History of java, Advantages of java, Java Compiler, Byte Code, JVM, Java Environment Setup, Programming Structure and naming conventions, Variables and Data types, Operators, Decision and Control Statements, Loops, Arrays and Strings, wrapper class. Basic I/O operations, Command line arguments,	10L
2.	**Constructor and Method :** Methods, Static variables and static methods, Overloading methods, Passing and returning object as argument, Constructors and Overloading constructors,	4L

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	Basic string handling Concepts	
3.	**Inheritance:** Use of inheritance, IS-A,HAS-A,USES-A relationship, Method overriding, Super keyword and Final keyword, Abstract classes and methods, Packages, Interfaces	08L
4	**Exception handling and Multithreading:** Exceptions and their types, Handling exceptions, Use of Multithread programming, Thread class and Runnable interface, Thread priority, Thread synchronization	06L
5	**File handling:** Stream classes, Class hierarchy, Creation of text file, Reading and writing text files.	04L
6	**Applets :** Applets and its life cycle, Graphics Class, AWT	04L
Total		**36L**

Course Outcomes:	
After completion of the course, students will be able to:	
1	Students are able to Install and work with JDK, understand Special features of Java and develop and implement Java programs for simple applications that make use of classes, objects, packages and interfaces.
2.	Students are able to handle exceptions in program and creates Threads in Applications.

Learning Resources:	
1	P. J. Deitel, H. M. Deitel, "Java for Programmers", Pearson Education, PHI, 4th Edition, 2007.
2	P. Radha Krishna, "Object Oriented Programming through Java", Universities Press, 2nd Edition, 2007
3	Sachin Malhotra, Saurabh Chaudhary, "Programming in Java", Oxford University Press, 5th Edition, 2010.
4	E Balguruswamy "Programming with Java- A Primer", Publisher : TMH
5	YashavantKanetkar "Let Us Java" Publisher : BPB
6	Steven Holzner "JAVA 2 Programming Black Book", Publisher : Wiley India

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Course Name:	Management Information System		
Course Code:	BSD302		
Semester:	III	Credit:	3
L-T-P:	3-0-0	Pre-Requisites:	
Full Marks:	50		
Examination Scheme:	Semester Examination: 35	Continuous Assessment:10	Attendance: 05

Course Objectives:	
1.	To inform about the requirement of Management Information System.
2.	Introduce about different types of Management Information System used in organizations.
3.	Study the effectiveness of Management Information System.

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1	An introduction to information systems, Information systems in organizations, Information Technology Concepts, The IS Revolution; Information requirement for the different levels lf management, transaction processing system, Management information 34 system, Decision support system. Strategic Role of Information Systems. Business Processes; Information management, and Decision Making. Computers and Information Processing	12L
2	Transaction processing system; hardware and software requirements, tools used, case studies, merits and demerits of transaction processing system.	6L
3	Managerial control, Information and tools required, difference between transactional system and managerial system. Frequency of taking outputs, Need for interconnected system, common database, Redundancy control, case studies. Decision support system, concept and tools, case studies, virtual organizations, strategic decisions-unstructured approach, cost and values of unstructured information.	12L
4	Optimization techniques, difference between optimization tools and DSS tools expert system, difference between expert system and management information system. Role of chief Information officer.	6L
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Course Outcomes:	
After completion of the course, students will be able to:	
1	Understand the leadership role of Management Information Systems
2.	Analyze and synthesize business information and systems to determine of strategic policies.
3.	Effectively communicate strategic policies for decision making.

Learning Resources:	
1.	Management Information System, Gupta A. K., S. Chand
2.	Information Management System, Ashima Bhatnagar Bhatia (Author), Meghna Sharma (Author), Vaibhav Bansal.

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Course Name:	Linux Operating System – Operations and Management		
Course Code:	BSD303		
Semester:	III	**Credit:**	3
L-T-P:	3-0-0	**Pre-Requisites:**	Basic knowledge of Operating System
Full Marks:	50		
Examination Scheme:	Semester Examination: 35	Continuous Assessment:10	Attendance: 05

Course Objectives:	
1	To provide knowledge about Linux operating system to enhance concept about operating system.
2.	To provide to concept about shell script and its use.
3.	To gather knowledge about system level administration

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1	**Introduction:** Concept of Operating System. History of Linux operating system, comparison between Linux and Unix, different distributions of Linux operating system. Advantages and disadvantages of Linux. Architecture of Linux operating system	3L
2.	**Commands:** Idea of different shells of Linux. Internal and external commands, manual/help of Linux commands, basic commands, command argument and options. Execution of commands in foreground and background.	6L
3.	**Linux File System and Partitions:** Directory structure, file attributes, file permission mode and change of permission mode. Essential commands for file handling. Concept of *boot block*, *super block*, *data bloc*k and *inode block*.	6L
4.	**The vi editor:** Command and insert mode of the editor, brief knowledge of commands of the modes. Concept of ex mode and its utilities. Knowledge about other editors.	3L
5.	**Shell script 1:** Idea of shell script and its use. Shell script writing techniques. Concept of if structure, case structure. Loops: while, until and for. Debugging and execution of shell script.	6L
6.	**Shell script 2:** Use of shell variable, positional parameters and their application in shell script. Application of regular expressions. String manipulation.	5L

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7.	**Linux system administration & X window:** Brief idea of system administration. Linux X window: Common Desktop Environment, starting and quitting X, Terminal Emulator, X resources etc.	7L
Total		**36L**

Course Outcomes:	
After completion of the course, students will be able to:	
1	Write shell script to develop applications for operating system
2.	Mange system administration in Linux platform

Learning Resources:	
1	Unix Concepts and Applications, Sumitabha Das, TATA McGRAW HILL
2	Unix Shell Programming, Yashavant Kanetkar, BPB

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Course Name:	Cyber Security		
Course Code:	BSD304		
Semester:	III	Credit:	3
L-T-P:	3-0-0	Pre-Requisites:	
Full Marks:	50		
Examination Scheme:	Semester Examination: 35	Continuous Assessment:10	Attendance: 05

Course Objectives:	
1	To familiarize with the basic terminology related to cybercrime and cyber security.
2.	To familiarize with the security challenges faced by mobile devices.
3.	To describe the Tools and Methods used in cybercrime.
4.	To motivate to analyze cybercrime, its ethical issues and apply different sections of Indian IT Act on it.

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1	1A: Introduction of Cybercrime & Cyber Security: Importance and challenges Cyberspace, Cyber threats, Hacking, Types of cybercrime and cyber criminals.	8L
	1B: Steps and categories of Cybercrime: Planning of attacks, social engineering, passive attack, Active attacks, cyber-stalking, Phishing methods, ID Theft and consequences.	8L
2.	Mobile & Wireless devices Security: Types of mobile devices, Security challenges posted by mobile devices, password protection for mobile devices, cryptographic security for mobile devices, Attacks on mobile/cell phones and other devices. Debit-Credit card theft and cloning. Security issues in POS.	8L
3.	Tools and Methods used in Cybercrime: Proxy servers, password checking, Random checking, Trojan Horses and Backdoors, DOS & DDOS attacks, SQL injection, buffer over flow.	6L
4.	Cyber Laws: Legal aspects, Indian IT Act, its subsections and case studies, Computer Offences and its penalty under IT Act 2000. Software Piracy and legal issues.	6L
Total		**36L**

Course Outcomes:	
After completion of the course, students will be able to:	
1.	Recall the basic terminology related to cybercrime and cyber security.

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2.	Identify the security challenges faced by mobile devices.
3.	Describe the Tools and Methods used in cybercrime.
4.	Apply different sections of Indian IT Act on situations arising out of cyber crime

Learning Resources:	
1.	Cyber Security, Nina Gobole & Sunit Belapune; Pub: Wiley India.
2.	Information Security and Cyber Laws, Pankaj Agarwal
3.	Information Security & Cyber Laws, Gupta & Gupta, Khanna Publishing House, (AICTE Recommended Textbook- 2018)

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Course Name:	Java Programming Lab		
Course Code:	BSD391		
Semester:	III	Credit:	1.5
L-T-P:	0-0-3	Pre-Requisites:	Basic understanding of object oriented concept
Full Marks:	50		
Examination Scheme:	Semester Examination: 30	Continuous Assessment:20	

Course Objectives:	
1	To build software development skills using java programming.
2.	To build GUI using applet and AWT

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1	Assignments on class, constructor, overloading, inheritance, overriding	9P
2.	Assignments on wrapper class, arrays, strings	6P
3.	Assignments on developing abstract class, interfaces	6P
4	Assignments on creating and accessing packages	3P
5	Assignments on multithreaded programming	3P
6	Assignments on exception handling	3P
7	Assignments on applet programming, event handling and AWT	6P
Total		**36P**

Course Outcomes:	
After completion of the course, students will be able to:	
1	Implement Java programs for simple applications that make use of classes, packages and interfaces.
2.	Design applications using applet and event handling.

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Learning Resources:	
1.	Java: The Complete Reference, (Complete Reference Series) by Herbert Schildt
2.	P. J. Deitel, H. M. Deitel, "Java for Programmers", Pearson Education, PHI, 4th Edition, 2007.

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Course Name:	PC Assembling and Maintenance Lab		
Course Code:	BSD395		
Semester:	III	Credit:	1.5
L-T-P:	0-0-3	Pre-Requisites:	
Full Marks:	50		
Examination Scheme:	Semester Examination: 30	Continuous Assessment:20	

Course Objectives:	
1.	Familiarization with hardware components of computer and other peripherals.
2.	To provide idea of setup a LAN.
3.	To provide knowledge about PC assembling.

Course Contents:		
Module No.	**Description of Topic**	**Contact Hrs.**
1	Familiarization with hardware components like SMPS, Mother Board, Processor, RAM, Hard Disk, DVD ROM drive, Ethernet Switch, UTP cable etc.	3P
2.	Assemble Desktop PC by connecting different hardware components with the mother board.	6P
3.	Familiarization with BIOS setup of a system and change the configuration. Create a bootable drive. Installation of Operating System.	9P
4	Concept of color code. Familiarization with crimping tool, Cable tester etc. Preparation of straight through and cross over cable using UTP cable and RJ45 connector.	9P
5	Connect systems with an Ethernet switch to setup a LAN.	6P
6	Installation of printer and other devices. A brief idea of trouble shooting for PC maintenance.	3P
Total		**36**P

Course Outcomes:	
After completion of the course, students will be able to:	
1.	Assemble a Desktop PC
2.	Install Operating System and install other hardware devices to a desktop.
3.	Setup a LAN

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Learning Resources:	
1.	PC Hardware: The Complete Reference, John Rourke and Craig Jacker, Mc Grow Hill
2.	Computer Hardware : Installation Interfacing Troubleshooting And Maintenance3 by K. L. James , Prentice-Hall of India Pvt.Ltd.

Course Name:	On Job Training		
Course Code:	OJT381		
Semester:	III	Credit:	15
L-T-P:	Sessional	Pre-Requisites:	
Full Marks:	200		
Examination Scheme:	Training in Semester: 200		

Training Scheme:
Students will go for an industrial training in the semester end for one month. After completion of the training, they will prepare a report and provide a presentation on the training in front of faculty members. On the basis of their report and presentation they will be evaluated.