Course Code CSD4008	Cyber Security Framework	Course Type LT	Credits 3

Course Objectives:

- To provide knowledge of various cyber security frameworks
- To provide knowledge of best practices of risk management to improve security.

Course Outcomes:

At the completion of this course, students should be able to do the following:

- Basics of cyber security framework.
- The Framework core for cyber security activities.
- The framework tier approaches for the implementation principles and practices for risk management to improve the security.

Student Outcomes (SO): b, c, i, k, l

b. An ability to analyze a problem, identify and define the computing requirements appropriate to its solution.

c. An ability to design, implement and evaluate a system / computer-based system, process, component or program to meet desired needs

i. Design and conduct experiment as well as analyze and interpret data.

k. An ability to use current techniques, skills and tools necessary for computing engineering practice.

l. An ability to apply mathematical foundations, algorithmic principles and computer science theory in the modeling and design of computer-based systems (CS)

Unit No	Unit Content	No. of hours	SOs
1	**Basic Fundamentals** Introduction: Types of Cyber Security Framework, Components of Framework, functions of Cyber Security Framework.	08	b,c,i
2	**The Framework Core** Introduction, cyber security activities, outcomes, informative references that are common across critical infrastructure sectors	10	c,i
3	**Framework Profile** Method to Implement organizational Profiles, alignment of cyber security activities with its business requirements, risk tolerances, and resources.	09	c,i
4	**Framework Implementation Tier**	08	c,i

	Mechanism for organizations to view, the characteristics of Cyber Security Risk, Approaches to manage Cyber security risk.		
5	**Principle and Practices** Principles and best practices of risk management to improve the security, organization and structure to today's multiple approaches to cyber security, Implementation of Cyber Security Framework in real time problem.	**08**	**c,i,k,l**
6	**Guest Lecture on Contemporary Topics**	**02**	
	Total Hours:	**45**	

Mode of Teaching and Learning: *Flipped Class Room, Activity Based Teaching/Learning, Digital/Computer based models, wherever possible to augment lecture for practice/tutorial and minimum 2 hours lectures by industry experts on contemporary topics*

Mode of Evaluation and assessment:
The assessment and evaluation components may consist of unannounced open book examinations, quizzes, student's portfolio generation and assessment, and any other innovative assessment practices followed by faculty, in addition to the Continuous Assessment Tests and Final Examinations.

Text Books:

1.	Data Science For Cyber-security: 3 (Security Science and Technology) by Niall M Adams, Nicholas A Heard, Patrick Rubin-delanchy
2.	Cyber Security: An Introduction for Non-Technical Managers Hardcover –by Jeremy Swinfen Green

Reference Books:

1.	Mastering Your Introduction to Cyber Security Paperback – by Dr Michael C Redmond Phd
2.	Cyber Security: A practitioner's guide Paperback – by David Sutton
3.	
4.	

Recommendation by the Board of Studies on	
Approval by Academic council on	
Compiled by	

Course Code CSE2006	Programming in Java	Course Type	Credits
		LP	3

Objectives:

Objectives

- To understand the basic concepts of Java and Java flow control
- To create Java technology applications that leverage the object-oriented features of the Java language, such as encapsulation, inheritance, and polymorphism
- To Implement error-handling techniques using exception handling and creating high-performing multi-threaded applications
- To Implement input/output (I/O) functionality to read from and write to data and text files and understand advanced I/O streams
- To Perform multiple operations on database tables using both JDBC and JPA technology and Java Collections framework

Expected Outcomes:

Students who complete this course will be able to

- Analyze the Java flow control using essentials of Java programming.
- Solve simple business problems using an object-oriented approach
- Demonstrate synchronization among different processes using a multithreading approach and exception handling techniques
- Implement Java Input and Output streaming using Java packages
- Develop and create real-time applications using JDBC and JPA technology

Student Outcomes (SO):

a. An ability to apply the knowledge of mathematics, science and computing appropriate to the discipline

b. An ability to analyse a problem, identify and define the computing requirements appropriate to its solution.

c. An ability to design, implement and evaluate a system / computer-based system, process, component or program to meet desired needs.

Unit No.	Unit Description	No of Hours	SO
1	**Java Introduction** Java Hello World, Java JVM, JRE and JDK, Difference between C & C++, Java Variables, Java Data Types, Java Operators, Java Input and Output, Java Expressions & Blocks, Java Comment **Java Flow Control** Java if...else, Java switch Statement, Java for Loop, Java for-each Loop, Java while Loop, Java break Statement, Java continue Statement	6	a, b, c

2	**Java Object-Oriented Programming** **Java OOP (Basics)** Java Class and Objects, Java Methods, Java Constructor, Java Strings, Java Access Modifiers, Java this keyword, Java final keyword, Java Recursion, Java instance of Operator, Java Single Class and Anonymous Class, Java enum Class **Java OOP (Inheritance & Polymorphism)** Java Inheritance, Java Method Overriding, Java super Keyword, Abstract Class & Method, Java Interfaces, Java Polymorphism (overloading & overriding), Java Encapsulation **Java OOP (Other types of classes)** Nested & Inner Class, Java Static Class, Java Anonymous Class, Java Singleton, Java enum Class, Java enum Constructor, Java enum String, Java Reflection	**6**	**a, b, c**
3	**Java Exception Handling** Java Exceptions, Java Exception Handling, Java try...catch, Java throw and throws, Java catch Multiple Exceptions, , Java Annotations Types **Multithreading** Introduction, Thread Creations, Thread Life Cycle, Life Cycle Methods, Java Synchronization methods, User-defined packages	**6**	**a, b, c**
4	**Java List & I/O Streams** String classes, methods, operations on Strings and 1-D Arrays, 2-D and Jagged Arrays and its operations Java Collections Framework, Java Collection Interface, Java List Interface, Java Array List, Java Vector, Java Stack Introduction to Byte-oriented and Character-oriented streams, Java I/O Streams, and Java Reader/Writer	**6**	**a, b, c**
5	**Database Applications with JDBC** Database Applications with JDBC: Defining the layout of the JDBC API - Connecting to a database by using a JDBC driver - Submitting queries and getting results from the database - Specifying JDBC driver information externally	**6**	**a, b, c**

	Java Persistence API JPA architecture, ORM COmponents, - Performing CRUD operations using the JDBC API. JPA installation, Java Persistence Query language, Creating JPA entities, Advanced mappings		
6	**Guest Lecture on Contemporary Topics**	**02**	
	Total Lecture:	**32**	

Mode of Teaching and Learning:
Flipped Classroom, Activity-Based Teaching/Learning, Digital/Computer-based models, wherever possible to augment lecture for practice/tutorial and minimum 2 hours lectures by industry experts on contemporary topics.

Mode of Evaluation and Assessment:
The assessment and evaluation components may consist of unannounced open book examinations, quizzes, student's portfolio generation, and assessment, and any other innovative assessment practices followed by faculty, in addition to the Continuous Assessment Tests and Term End Examination.

Text Book(s):

1.	Herbert Schildt, "Java The complete reference", 11th edition, Oracle press , 2018

Reference Book(s):

1.	Oracle University Reference E-Kit
2.	Deitel and Deitel, "Java How to Program (Early objects)",10thedition,Pearson, 2015
3.	Cay S.Horstmann and Gary Cornell, "Core Java Vol I–Fundamentals",8thedition,Pearson, 2011
4.	Steven Holzner et al., "Java 2 Black Book", Dreamtech press, Reprint edition 2010

No.	**Indicative List of Experiments**	**SO - i**
1	Write a program to implement constructor in java.	
2	Write a program to implement Class concept in java.	
3	Write a Program to implement method overloading by using static method in java.	
4	Write a Program to implement method overloading in single class in java.	
5	Write a Program to implement simple inheritance in java.	
6	Write a Program to implement method overriding in java.	
7	Write a Program to call base class constructor using super keyword in java.	
8	Write a Program to call base class method using super keyword in java.	
9	Write a Program to implement run time polymorphism by applying dynamic dispatch method in method overriding.	
10	Write a java Program to using Array.	
11	Write a java Program to implement Abstract class.	
12	Write a java Program to implement Interface.	
13	Write a java Program to implement multithreading by extending Thread class.	

14	Write a Java program to fetch data from database using (JDBC-ODBC bridge).	
15	Write a Java program to calculate factorial of any number entered by user using looping statements	
16	Write a java program using I/O streams	
Recommendation by the Board of Studies on		27.12.2021
Approval by Academic council on		
Prepared By		Dr Lakshmi D
Compiled by		Dr. M. Ashwin & Dr. Sandip Mal