DEPARTMENT OF COMPUTER SCIENCE ENGINEERING
SAPTHAGIRI COLLEGE OF ENGINEERING
LESSON PLAN FOR THE ACADEMIC YEAR: ODD 2018-19
(For students)

Course	ADVANCED JAVA AND J2EE			Course code			15CS553
Faculty	Prof. NANDA M B			Semester			V
Core/Elective	Contact Hours /week			Total Hours	Assessment		Credits
Core	L	T	P	40	CIE	SEE	4
	4	1	-		20	80	
Prerequisite	1. Basic Java , Servlets 2. Swings , Applets						

Course Objectives

1	Identify the need for advanced Java concepts like Enumerations and Collections
2	Construct client-server applications using Java socket API
3	Make use of JDBC to access database through Java Programs
4	Adapt servlets to build server side programs
5	Demonstrate the use of JavaBeans to develop component-based Java software

Syllabus	RBT Level
MODULE 1	
Enumerations, Autoboxing and Annotations(metadata): Enumerations, Enumeration fundamentals, the values() and valueOf() Methods, java enumerations are class types, enumerations Inherits Enum, example, type wrappers, Autoboxing, Autoboxing and Methods, Autoboxing/Unboxing occurs in Expressions, Autoboxing/Unboxing, Boolean and character values, Autoboxing/Unboxing helps prevent errors, A word of Warning. Annotations, Annotation basics, specifying retention policy, Obtaining Annotations at run time by use of reflection, Annotated element Interface, Using Default values, Marker Annotations, Single Member annotations, Built-In annotations.	L1,L2,L3
MODULE-2	
The collections and Framework: Collections Overview, Recent Changes to Collections, The Collection Interfaces, The Collection Classes, Accessing a collection Via an Iterator, Storing User Defined Classes in Collections, The Random Access Interface, Working With Maps, Comparators, The Collection Algorithms, Why Generic Collections?, The legacy Classes and Interfaces, Parting Thoughts on Collections.	L1,L2,L3

MODULE 3	
	L2,L3,L4
String Handling : The String Constructors, String Length, Special String Operations, String Literals, String Concatenation, String Concatenation with Other Data Types, String Conversion and toString( ) Character Extraction, charAt( ), getChars( ), getBytes( ) toCharArray(), String Comparison, equals( ) and equalsIgnoreCase( ), regionMatches( ) startsWith( ) and endsWith( ), equals() Versus == , compareTo( ) Searching Strings, Modifying a String, substring( ), concat( ), replace( ), trim( ), Data Conversion Using valueOf( ), Changing the Case of Characters Within a String, Additional String Methods, StringBuffer , StringBuffer Constructors, length( ) and capacity( ), ensureCapacity( ), setLength( ), charAt( ) and setCharAt( ), getChars( ),append( ), insert( ), reverse(), delete( ) and deleteCharAt( ), replace( ), substring( ), Additional StringBuffer Methods, StringBuilder	
MODULE 4	
Servlet: Background; The Life Cycle of a Servlet; Using Tomcat for Servlet Development; A simple Servlet; The Servlet API; The Javax.servlet Package; Reading Servlet Parameter; The Javax.servlet.http package; Handling HTTP Requests and Responses; Using Cookies; Session Tracking. **Java Server Pages (JSP):** JSP, JSP Tags, Tomcat, Request String, User Sessions, Cookies, Session Objects	L2,L3,L4
MODULE 5	
The Concept of JDBC; JDBC Driver Types; JDBC Packages; A Brief Overview of the JDBC process; Database Connection; Associating the JDBC/ODBC Bridge with the Database; Statement Objects; ResultSet; Transaction Processing; Metadata, Data types; Exceptions.	L1,L2,L3

In standard form (search in Google for details)
Author name, title, edition, publisher, place, and year

Reference / Text Book Details

Sl. No.	Title of Book	Author	Publication	Edition
1	**JAVA The Complete Reference**	Herbert Schildt	Tata McGraw Hill	$7^{th}/9^{th}$
2	**J2EE The Complete Reference**	Jim Keogh	Tata McGraw Hill	2007
3	**Introduction to JAVA Programming**	Y. Daniel Liang	Pearson Education, 2007	7th
4	**The J2EE Tutorial**	Stephanie Bodoff	Pearson Education, 2004	2nd
5	**Advanced JAVA Programming**	Uttam K Roy	Oxford University Press	2015

Course outcomes	
At the end of this course the students will be able to,	
CO1	Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs.
CO2	Build client-server applications and TCP/IP socket programs
CO3	Illustrate database access and details for managing information using the JDBC API
CO4	Describe how servlets fit into Java-based web application architecture
CO5	Develop reusable software components using Java Beans

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Lesson plan

Period	Planned On	Topic Covered	Delivered On
1		Enumeration-fundamentals, methods, class types	
2		Enumeration Inherits Enum, Examples	
3		Type Wrappers	
4		Autoboxing-Methods,, expressions, Boolean & Character	
5		Autoboxing /unboxing prevent errors, warning	
6		Autoboxing /unboxing continue	
7		Annotations-Basics, retention policy, run time reflection	
8		Annotated element Interface	
9		using default values	
10		Marker Annotations	
11		Built-In Annotations with example programs	
12		Single Member annotations with example	
At the end of this topic students able to Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs.			
13		Collection Overview, Recent changes to collections	
14		Collection Interfaces types, The Collection Interface with all the methods	
15		The List Interface	
16		The SortedSet Interface	
17		The Set Interface	

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18		The NavigableSet Interface	
19		The Deque Interface The Queue Interface	
20		Obtaining an Array from an ArrayList with program example	
21		Storing User-Defined classes with program example	
22		Collection classes , The AraayList class with example program	
23		Methods of AraayList class with program	
24		LinkedList class, Difference between ArrayList and Linked List	
25		LinkedHashSet Class, Example of LinkedHashSet class	
26		HashSet class, Example of HashSet class	
27		Accessing a collection via Iterator, storing user defined classes in collections	
28		Random Access Interface	
29		Working with maps	
30		Working with comparators	
31		Collection Algorithms	
32		Why Generic Collections?	
33		Legacy classes & Interfaces	
34		Parting thoughts on collections	
At the end of this topic students able to **Construct client-server applications using Java socket API**			
35		String constructors, string length, String operations, String literals	

36		String Concatenation, with other data types, String Conversion and toString(), charAt(), getchars()	
37		Getbytes(), toCharArray(), String comparision, equals(), equalsIgnoreCase(), regionMatches()	
38		startsWith(), endswith(), equals() versus ==, compareTo(), searching strings, modify strings	
39		Substring(), concat(), replace(), trim(), Data conversion using valueof(), changing the case	
40		Additional String Methods, String Buffer, Constructors, length(), capacity(), ensurecapacity()	
41		setLength(), charAt(), setCharAt(), getchars(), append, insert, reverse, delete	
42		deleteCharAt(), replace, sunstring(), Additional String Buffer Methods	
43		Background, life cycle of servlet, using Tomcat	
44		A Simple Servlet, Servlet API	
45		Javax.servlet package. Reading servlet parameter, Javax.servlet.http package	
46		Handling HTTP requests & Responses, using cookies and sessions.	
47		Java Server Pages: JSP, JSP tags, Tomcat	
48		Request String, User Sessions	
49		Cookies	
50		Session Objects	
At the end of this topic students able to **Adapt servlets to build server side programs**			
51		The concept of JDBC	

52		JDBC Driver Types, JDBC packages	
53		A brief overview of JDBC process; Database Connection	
54		Associating the JDBC/ODBC bridge with the database	
55		Statement Objects, Resultset	
56		Transaction Processing	
57		Metadata, Data Types	
58		Exceptions	
At the end of this topic students able to **Demonstrate the use of JavaBeans to develop component-based Java** **software**			

PROGRAMME OUTCOMES

Program outcomes are narrower statements that describe what students are expected to know and be able to do by the time of graduation. These relate to the skills, knowledge and behavior. Graduation students of **Bachelor of Computer Science Engineering** program at Sapthagiri College of Engineering will attain the following program outcomes **in the field of Computer science engineering.**

	PROGRAM OUTCOME	
PO1.	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem analysis**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3.	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4.	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5.	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities

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		with an understanding of the limitations.
PO6.		**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7.		**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8.		**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9.		**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10.		**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11.		**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12.		**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES

The graduates of Computer Science engineering program of Sapthagiri College of Engineering should be able to attain the following at the time of graduation.

	PROGRAM SPECIFIC OUTCOMES
PSO1	Apply the knowledge gained from Mathematics, Basic Computing, Basic Sciences and Social Sciences in general and all computer science courses in particular to identify, formulate and solve real life engineering problems
PSO2	Identify the various analysis & design methodologies for facilitating development of high quality system software products with focus on performance optimization

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CO-PO Mapping

Course outcomes		\multicolumn{12}{c}{Program Outcomes}											PSO		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	POS1	POS2	POS3
O-1		4	2	2	2	3	-	-	-	-	-	2	-	-	-	-
CO-2		2	2	2	-	-	-	-	-	-	-	-	-	-	2	2
CO-3		2	2	2	-	-	-	-	-	-	-	-		2	-	-
CO-4		2	2	3	-	-	-	-	-	-	-	-	-	2	-	-
CO-5		2	2	2	-	-	-	-	-	-	-	-	-	2	-	-
Average		2.4	2	2.2	-	-	-	-	-	-	-	-	-	2	2	2

Mapping of Course outcomes (COs) and Program Ooutcomes (POs)
Note: 1 = Slight   2 = Moderate   3 = Good   4 = Excellent

Faculty Signature

HOD

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