Course code	e		JAVA Progra	amming				P J C
CSE 1007				···			<del></del>	2 0 4
Pre-requisi	te					Sy	yllabus	version
								v.1.0
Course Obj	jectives:					•		
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		API) for implen						
		and development	of dynamic we	eb applicati	ons using J	avaFX	GUI,	Servlets
and .	Java Serv	er Pages.						
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Expected C			esa tha studant s	hould be al	alo to			
		mpleting the cour						
• IIIIpi	lement Jav	va applications to	solve lear worr	u problems	) 			
• Desi	gn and bu	ild multi-threade	d Java applicati	ions				
• Desi	gn, Devel	op and Deploy d	ynamic web app	plications u	sing JavaFX	K, Serv	lets and	l Java
Serv	er Pages							
Student Lea	arning O	utcomes (SLO):	1,9,14					
	<u> </u>		<i>F 1</i>					
Module:1	Java Ba				5 hours			SLO: 1
			Language - JV			source	file str	
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	dule:6 Servlet		6 hours	SLO: 9,14
	oduction to servlet - Lifecycle of Serv			
	loyment Descriptor (web.xml) - Han		est and Respo	onse –Servlets with
data	base communication - Session Tracking			
N/I	I.I7 ICD		4 1	CI O. 1.14
	dule:7   JSP Tags and Expressions - JSP Expression	Language (FL) II	4 hours	SLO: 1,14
331	1 ags and Expressions - 331 Expression	Language (EL) - O	sing Custom 1	ag.
Mod	dule:8 Contemporary issues:		2 hours	•
	istry expert talk		2 Hours	•
	7 - 1			
	Tot	al Lecture hours:	45 hours	
		ar zectare mours.	ie nours	
Tev	t Book(s)			
1.	Herbert Schildt, The Complete Referen	nce -Java. Tata McC	Graw-Hill publi	sher, 10 <sup>th</sup>
	Edition, 2017.	100 000 00, 1000 1,100	Provinces	.5.1.01, 10
	,			
Ref	erence Books			
1.	Y. Daniel Liang, "Introduction to Java	programming" -con	nprehensive ve	rsion-11th Edition,
	Pearson publisher, 2017		· la	
2.	Cay Horstmann,"Big Java", 4th edition			
3.	E.Balagurusamy, "Programming with J	ava", Tata McGraw	-Hill publisher	rs, 5 <sup>rd</sup> edition, 2014.
4	Paul J. Deitel, Harvey Deitel ,Java SE	8 for Programmers	(Deitel Develo	oper Series) Prentice
	Hall publisher, 3rd Edition, 2014			
	1 CF 1 (			
Mod	de of Evaluation:			
List	of Challenging Experiments (Indicat	ive)	S	SLO: 14
1.	Write a program to demonstrate	the knowledge	of students	in
	multidimensional arrays and looping of	constructs.		
	Eg., If there are 4 batches in B	Tech - "CSF1007"	' course read	the
	count of the slow learners (who h			
	· ·	*		
	should be assigned in the ratio of	` •		
	should be one tutor). Determine			
	Create a 2-D jagged array with			
	learners in the 4 batches. The nu			
	be equal to the number of groups	=		_
	If there are 23 slow learners in a			
	and in the jagged array, the corre	sponding row shoul	d store 4, 4, 4	, 4,
	4,3). Use for-each loop to travers	e the array and prin	t the details. A	Also

	print the number of batches in which all tutors have exactly 4 students.	
2.	Write a program to demonstrate the knowledge of students in String	
2.		
	handling.	
	Eg., Write a program to read a chemical equation and find out the	
	count of the reactants and the products. Also display the count of the	
	number of molecules of each reactant and product.	
	Eg., For the equation, 2NaOH + H2SO4 -> Na2SO4+ 2H2O, the O/P	
	should be as follows.	
	Reactants are 2 moles of NaOH, 1 mole of H2SO4.	
	Products are 1 mole of Na2SO4 and 2 moles of H2O.	
3.	Write a program to demonstrate the knowledge of students in Inheritance.	
	Eg: Assume that a bank maintains two kinds of accounts for customers, one called as savings account and the other as current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should maintain a minimum balance and if the balance falls below this level, a service charge is imposed.  Create a class account that stores customer name, account number and type of account. From this derive the classes cur_acct and sav_acct to make	
	them more specific to their requirements. Include necessary member functions in order to achieve the following tasks:	
	<ul> <li>a) Accept deposit from a customer and update the balance.</li> <li>b) Display the balance</li> <li>c) Compute and deposit interest.</li> <li>d) Permit withdrawal and update the balance.</li> <li>a) Check for the minimum balance impress panelty, pagessary, and</li> </ul>	
	e) Check for the minimum balance, impose penalty, necessary, and update the balance.	
4.	Write a program to demonstrate the knowledge of students in working with	
	user-defined packages and sub-packages.	
	Eg., Within the package named 'primespackage', define a class Primes	

	which includes a method checkForPrime() for checking if the given	
	number is prime or not. Define another class named TwinPrimes outside of	
	this package which will display all the pairs of prime numbers whose	
	difference is 2. (Eg, within the range 1 to 10, all possible twin prime	
	numbers are (3,5), (5,7)). The TwinPrimes class should make use of the	
	checkForPrime() method in the Primes class.	
5.	Write a program to demonstrate the knowledge of students in Java	
	Exception handling.	
	Eg., Read the Register Number and Mobile Number of a student. If the	
	Register Number does not contain exactly 9 characters or if the Mobile	
	Number does not contain exactly 10 characters, throw an	
	IllegalArgumentException. If the Mobile Number contains any character	
	other than a digit, raise a NumberFormatException. If the Register Number	
	contains any character other than digits and alphabets, throw a	
	NoSuchElementException. If they are valid, print the message 'valid' else	
	'invalid'	
6	Write a program to demonstrate the knowledge of students in	
	multithreading. Eg., Three students A, B and C of B.Tech- II year contest for the PR	
	election. With the total strength of 240 students in II year, simulate the vote	
	casting by generating 240 random numbers (1 for student A, 2 for B and 3	
	for C) and store them in an array. Create four threads to equally share the task of counting the number of votes cast for all the three candidates. Use	
	synchronized method or synchronized block to update the three count	
	variables. The main thread should receive the final vote count for all three	
7	contestants and hence decide the PR based on the values received.	
,	Write a program to demonstrate the knowledge of students in File handling. Eg., Define a class 'Donor' to store the below mentioned details of a blood	
	donor.	
	Name, age, Address, Contact number, blood group, date of last donation	
	Create 'n' objects of this class for all the regular donors at Vellore. Write	
	these objects to a file. Read these objects from the file and display only	

those donors' details whose blood group is 'A+ve' and had not donated for the recent six months.

8 Write a program to demonstrate the knowledge of students in working with Java collection framework.

Eg., Assume only a maximum of 3 courses can be registered by a student for week end semester classes. Create a hashmap 'h1' with 'n' key-value pairs where keys are the names of students and values are the courses registered by them. Create another hashmap 'h2' with 'm'key-value pairs where keys are the names of courses offered for B.Tech and values are the names of faculty handling the courses. Write appropriate code to

- Add or remove a student from h1
- Iterate over the maps and display the key-value pairs stored in them
- Given a student name, fetch the names of all those who teach him/her.

Eg:, if the elements of h1 are

Stud	Courses registered
name	
A	Python, maths, c
В	c, c++
С	C++, physics, chemistry

## And if the elements of h2 are

Course name	Faculty
Python	111
Maths	222
С	333
C++	444

	Physics`	555						
	Chemistry	666						
	Digital	777					_	
	electronics							
	For the student	"B", fa	culty shoul	d be dis	played a	s 333 and 4	144.	
9	Write a progr	ram to	demonstr	ate the	knowle	dge of stu	idents in GUI	
	programming u	using Ja	/aFX.					
10	Write a program				U			
	Eg: Create a stu						· ·	
	values in the ta		spiay ali ti	ie detaii	is of the	student tat	ole in a tabular	
11	Write a progra	am to	demonstrat	e the k	nowledg	ge of stude	ents in Servlet	
	programming.							
	Eg., Write a ser	rvlet wl	nich counts	how ma	any time	s a user ha	s visited a web	
	page. If the use	er is vis	iting the p	age for	the first	time, disp	lay a welcome	
	message. If the	e user i	s re-visitin	g the pa	age, disp	olay the nu	imber of times	
	visited. (Use co	ookies)						
12	Write a program			the kn	owledge	e of studen	its in handling	
	HTTP Request	and Re	sponse.					
	Eg: Write a pro	ogram to	create a s	hopping	g mall. U	ser must be	e allowed to do	
	purchase from	two pa	ges. Each	page sh	ould hav	e a page t	otal. The third	
	page should dis	splay a	bill, which	consis	ts of a p	age total o	of whatever the	
	purchase has be	een don	e and print	the total	l. (Use H	[ttpSession]	)	
13.	Write a program	m to dei	nonstrate t	ne know	ledge of	students in	JSP.	
	Eg: Client send receives, validates response.			-				
14.	Write a program	m to dei	nonstrate t	ne know	ledge of	students in	JSP.	

Eg: Create a JSP page for an online multiple choice test. The questions are randomly selected from a database and displayed on the screen. The choices are displayed using radio buttons. When the user clicks on next, the next question is displayed. When the user clicks on submit, display the total score on the screen.

Mode of evaluation:

Recommended by Board of Studies DD-MM-YYYY

Approved by Academic Council No. xx Date DD-MM-YYYY

## Session-wise Plan

S.No	Topics Covered	Class	Lab	Levels of	Text/Reference	Remarks
		Hours	Hours	mastery	Book	
1	Java source file structure –basic programming constructs - comments – Lexical issues - data types –	2	2	Familiarity	1	Lab Component
	variables - operators					
	- control and looping					
2	Arrays – one dimensional multi- dimensional – enhanced for loop – String, StringBuffer & StringBuilder, Wrapper classes	3	2	Familiarity	1	Lab Component
3	Class Fundamentals - Object & Object reference – array of objects – constructors – methods – overloading – "this" reference – static block - nested class – inner class – garbage collection – finalize()	4	2	Usage	1	Lab Component
4	Inheritance – types - use of "super" - Polymorphism – abstract class – interfaces – packages and sub packages.	3	2	Usage	1	Lab Component
5	Robustness and Concurrency: Exception Handling	4	2	Usage	1	Lab Component

	- Exceptions & Errors - Types of Exception - Control Flow in Exceptions - Use of try, catch, finally, throw, throws in Exception Handling - user defined exceptions					
6	Multithreading — Thread creation — Life cycle of Thread- Thread priorities methods to prevent Thread execution - synchronization — interthread communication — deadlock.	4	2	Usage	1	Lab Component
7	Files, Streams and Object serialization, Data structures: Java I/O streams – Working with files – Serialization and deserialization of objects	3	2	Usage	1	Lab Component
8	Collection framework – List, Map, Set, Generics	3	2	Assessment	1	Lab Component
9	GUI programming using JavaFX,	2	2	Usage	1	
10	Exploring events, controls and JavaFX menus	4	2	Usage	1	Lab Component
11	Working with JDBC	1	2	Usage	1	Lab Component
12	Introduction to servlet - Servlet life cycle - Developing and Deploying Servlets	3	2	Assessment	1	
13	Exploring Deployment Descriptor	3	2	Usage	1	Lab Component

	(web.xml) - Handling Request and Response – Accessing Database- Session Tracking & Management.						
14	JSP Tags and Expressions - JSP Expression Language (EL) - Using Custom Tag	4	2	Usage	4	Lab Component	