

**Course:**BTech**Semester:** 3**Prerequisite:**Basicknowledgeof software applications

CourseObjective: This course providesa broad introductionto softwareengineering.The variousprocessmodelsrequiredto develop software is also being described.Moreover the functionaland non-functionalrequirementsare also described.

Teachingand ExaminationScheme

TeachingScheme					Examination Scheme					Total
Lecture Hrs/Week	Tutorial Hrs/Week	Lab Hrs/Week	Hrs/Week	Credit	InternalMarks			ExternalMarks		
					T	CE	P	T	P	
2	0	0	0	2	20	20	-	60	-	100

SEE - Semester End Examination, T - Theory, P- Practical

CourseContent

W - Weightage(%),T - Teachinghours

Sr.	Topics	W	T
1	Designintroduction: Object-oriented programming, oops principles, encapsulation, inheritance and polymorphism java as a oops & internet enabled language, importance of java, java usage in industry, the byte code, compiling, and running of simple java program, jvm, jdk, jre	8	4
2	Datatypes,variable,operators: Data types,variables,dynamicinitialization,scopeand lifetimeof variables,type conversionandcasting,operators	10	4
3	Controlstatements: ConditionalStatements,LoopingStatements,Jump Statements	10	5
4	Arrays: Array,ArrayvaluesandmemorystorageStructure,Types of Arrays.	8	4
5	Objectoriented programming: Classes and objects: conceptsof classes and objects, declaringobjects, assigning object referencevariables, methods,constructors,accesscontrol, garbagecollection,usageof static withdata and methods,usage of finalwith data, overloadingmethodsand constructors,parameter passing - call by value, recursion, nested classes.	18	9
6	Inheritance: InheritanceBasics,memberaccessrules,Usageof super key word, formsof inheritance,MethodOverriding, Abstract classes, Dynamic methoddismatch, Using final with inheritance	8	2
7	Strings,Packagesand Interfaces: String handlingfunctions,Packages, Class path, importingpackages,differencesbetweenclassesand interfaces, Implementing& Applyinginterface, enumerations in java.	12	5
8	ExceptionHandling: Exceptions,Types of Exceptions,Handlingof Exceptions	8	3
9	MultiThreading: Thread,Usageof threads,Typesof threads, Handling Threads	10	4
10	CollectionsFramework: FunctionalProgramming,Collections,Hierarchyof collections	5	8

Reference Books

1.	IntroductiontoJava Programming(ComprehensiveVersion)Daniel Liang; Pearson(TextBook)
2.	CoreJavaVolume-IIFundamentalsHorstmann& Cornell; Pearson
3.	CompleteReferenceJava2 HerbertSchildt;TMH

CourseOutcomes

At the end of this course Students Will be able to:

1	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects
2	Understand dynamic memory management techniques using pointers, constructors, destructors, etc
3	Describe the concept of function overloading, operator overloading, virtual functions and polymorphism
4	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
5	Demonstrate the use of various OOPs concepts with the help of programs

CourseOutcome

After Learning the Course the student shall be able to:

After learning the course the students shall be able to:

1. Understand the principles and practice of object oriented programming.
2. Write, compile and debug programs with Java compiler.
3. Create a robust application using exception handling.
4. Understand the principles of synchronization and design application using multi-threading.

Course:BTech

Semester: 3

Prerequisite:Basicknowledgeof software applications

CourseObjective: This course providesa broadintroductionto softwareengineering.The variousprocessmodelsrequiredto develop softwareis also being described.Moreover the functional and non-functionalrequirementsare also described.

Teachingand ExaminationScheme

TeachingScheme					Examination Scheme					Total
Lecture Hrs/Week	Tutorial Hrs/Week	Lab Hrs/Week	Hrs/Week	Credit	InternalMarks			ExternalMarks		
					T	CE	P	T	P	
0	0	2	0	1	-	-	20	-	30	50

SEE - Semester End Examination, T - Theory, P- Practical

CourseOutcome

AfterLearningtheCoursethestudentsshall be able to:

Afterlearningthecoursethe students shallbeableto:

1. Understandthe principlesandpracticeof objectorientedprogramming.
2. Write, compileanddebugprogramswith Java compiler.
3. Createarobust applicationusingexceptionhandling.
4. Understandthe principlesof synchronizationand designapplicationusing multi-threading.

**ListofPractical**

1.	writea programtodisplayHelloWorldmessagein consolewindow.
2.	Writea programtoperformarithmeticandbitwiseoperationsin a singlesourceprogramwithoutobjectcreation.
3.	Write a programto performarithmeticandbitwiseoperationsby creatingindividualmethods andclassesthan createan object to execute the individualmethods of each operation.
4.	Writea javaprogramtodisplaytheemployeeetailsusing Scannerclass.
5.	Writea Javaprogramthatprintsall realsolutionstothequadraticequation $ax^2+bx+c=0$. Read in a, b, c andusethe quadraticformula.If thediscriminate b^2-4ac is negative,displaya messagestatingthatthereareno real solutions?
6.	The Fibonaccisequence is defined by the following rule. The first 2 values in the sequenceare 1, 1. Every subsequent value is the sum of the 2 values preceding it. Write a Java program that uses both recursive and non- recursive functions to print the nth value of the Fibonaccisequence?
7.	Write a Javaprogramthatpromptstheuserforan integerandthen printsoutalltheprimenumbersupto thatInteger?
8.	Writea Javaprogramtomultiplytwogivenmatrices?
9.	Writea Javaprogramforsortingagivenlist of namesin ascendingorder?
10.	Write a javaprogramforMethodoverloadingandConstructoroverloading
11.	Writea javaprogramtorepresentAbstractclasswith example.
12.	Writea programto implementmultipleInheritances.
13.	write programtodemonstratemethodoverridingand super keyword.
14.	Writea javaprogramtoimplementInterfaceusingextendskeyword.
15.	Writea javaprogramtocreateinnerclasses.
16.	Write a javaprogramtocreateuserdefinedpackage.
17.	Writea Javaprogramthatdisplaysthenumberofcharacters,linesand wordsin a text?
18.	Writea Javaprogramthatcheckswhetheragivenstringis a palindromeornot.Ex: MADAM is a palindrome?
19.	Writea Java programthatreads a line of integersandthendisplayseachintegerandthesumofall integers.(Use StringTokenizer class)?
20.	Writea javaprogramforcreatingsingletryblockwith multiplecatchblocks.
21.	writea programformultipletryblocksand multiplecatchblocksincludingfinally.
22.	write a programtocreateuserdefinedexception.
23.	Writea java programforproducerandconsumerproblemusingThreads.
24.	Write a java program that implements a multi-threadapplicationthat has three threads. First thread generatesrandom integer every 1 secondand if the value is even, secondthreadcomputesthe squareof the numberand prints. If the value is odd, the third thread will print the value of cubeofthe number.
25.	write a programto createdynamicarrayusing ArrayListclassandthe printthecontentsofthearrayobject.
26.	Writeprogramsto implementadd,searchand removeoperationon ArrayList object.

Miscellaneous**ExamRequirement**

It consistsof Assignments/Seminars/Presentations/Quizzes/Surprise Tests (Summative/MCQ)etc.