



## PUNJAB COLLEGE OF TECHNICAL EDUCATION COURSE - PLAN (July 10 - Dec 10)

<b>SUBJECT:</b>	Introduction to Internet & Java
<b>CODE:</b>	BC – 501 (N2)
<b>CLASS:</b>	BCA – 5th Sem
<b>TEACHERS:</b>	Mr. Harman Jit Singh Kanwer (HS) Mr. Ramandeep Sharma (RS) Mr. Nikhil K. Sahore(NKS) Ms. Shruti Jain (SRJ)

### Course Description:

This course is an introduction to Internet and Java. In this class, we will focus on Internet, Protocols, Applications etc.

More specifically, we will cover the following topics:

- Introduction to internet and Java
- Encapsulation
- Polymorphism
- Java Virtual Machine
- Exceptions
- Threads
- Applets
- Event Handling

### Prerequisites:

Students should have basic knowledge of following topics for the better understanding of concepts of internet and java:

- Encapsulation
- Class and Objects
- Polymorphism
- Inheritance

### Course Goals:

The goal of this course is for you to learn internet, its benefits, develop an understanding of java virtual machine, exception handling, applets. The course includes topics on world wide web, internet protocols, internet addressing, java applets, exception handling, event handling

The objective of this course :

- Students should be able to describe the internet.
- Students should be able to write programs in java
- Students should possess the skills to test and debug java programs in the laboratory.
- Students should understand techniques for writing a program in eclipse editor so that they can easily differentiate these two different concepts.
- Students should understand the exception handling, threads, event handling, network programming

### Scope and Opportunities:

This course offers an opportunity to be at the forefront of the emergent practice of internet and java. The graduates of this course can be absorbed in the mainstream of applets, internet programming and JDBC.

### Grading:

Assignments:	5
Tests:	10
Presentation:	5
MSEs:	15
Behavior:	5
<b>Total:</b>	<b>40</b>

### Rules for Assignments:

#### Purpose:

The assignments will primarily be practice problems for the exams. Thus, you should not collaborate on it with others by splitting the work and sharing answers. You will gain the most benefit from doing it by yourself. You can, of course, ask me for help. If someone in the class asks you for help on assignments, handle the situation as if you are a course instructor. Don't just give them an answer, but make sure they know how to find the answer on their own. ***If I feel that people have submitted answers that are merely copies of each other, I will grade the one solution and divide the credit for it equally among the copies i.e. ZERO.***

### Due Date:

As indicated in the course break-up below.

### Late Policy:

You must do your work on time because we'll be correcting/discussing it in class. ***No assignment will be accepted after the due date.*** If you know that you have a specific time conflict, make arrangements with me in advance for a separate assignment for late submission.

**Format:**

All assignments should be done according to the following format:

- Assignment must have a cover page including *title of assignment, subject, date of submission, students name, class, roll no. and submitted to.*
- For a sample of cover page, visit my website <http://www.w3professors.com>.
- Use loose sheets with one side plain and other side lined.
- Write questions/headings with black pen and other text with blue pen.
- Draw diagrams (if necessary), neat and clean with pencil on plain side of paper.
- Pages should be numbered.
- Mention **Contents** at the beginning and **References** at the end of each assignment.

**Tests:**

Tests can be oral/written/open book. Open book test is so that you can look up formulas or data from the text or lecture notes. You need to be sufficiently familiar with the material in the book to know where to look up the information that you need. The purpose of the exams is for you to demonstrate that you have attained an operational level of understanding of the material.

The tests will be conducted on the dates mentioned in the course break-up. No extra test will be conducted for the absentees. If you have any time conflict for the test, contact me in advance so that we can make sufficient arrangements. Keep in mind that there will be no improvement test at the end of the semester. Therefore, it's your responsibility to give test on time.

**Presentation:**

One presentation will be held for operating system. You will be informed well in advance. The rules for presentation are as follows:

- Group will be of 3-4 students.
- Students can make groups of their choice.
- Students should be in strict formals for the presentation.
- Three attendances will be taken during presentation. One at sharp 9:00 am, second after lunch break, and third at the end of the presentation.
- **Present** will be counted only for those students who'll be present in all the three attendances.
- Marks will be given only to the present students.
- Marks will be deducted for each misbehavior/indiscipline during the presentation.
- Topics will be given at first-cum-first-get basis. No topic will be repeated.

- Marks for the presentation are distributed as follows:

Attendance:	6 marks
Report:	2 marks
Synopsis:	3 marks
Confidence:	5 marks
Query Handling:	9 marks
<b>Total:</b>	<b>25 marks</b>
Indiscipline:	- 5 (for each misbehave)

### **Class Participation:**

A large component of your learning takes place in class. The actual concepts of operating system are fairly simple, although their implementation is often complicated by real-world constraints. Thus, I tend to give lectures to explain these concepts, and pose questions for discussion that are meant to draw out these implications. I will guide discussion, and add information here and there as necessary to carry the discussion forward or to lead it into a digression that adds depth in a different direction.

I will frequently have in-class exercises that you will do as individual/groups. Thus, it is very important that you attend class regularly. I will keep attendance throughout the semester. Please let me know in advance of any scheduled absences.

It is very important that we focus our attention during the limited time we have together. Each of us comes to the classroom distracted by thoughts from outside. Thus, each day we will take about two minutes at the beginning with a brief mind-clearing exercise, followed by a focusing exercise. During the mind-clearing exercise we will sit in silence and concentrate on our breathing. Because it is important that we not be distracted while doing these exercises, I will close the door promptly at the starting time for class. If you arrive late and the door is already closed, please wait outside until I reopen it and invite you in.

### **Classroom Policies:**

Following are the classroom policies and they are meant to be strictly followed:

- Be punctual for the class; try to minimize your disturbance if you are late. I may not reject students who come after 5 minutes from the scheduled time but without attendance.
- Student coming late will be considered as *late arrival* and I will record late arrivals on the day's attendance.
- Three late arrivals equals to one absent.
- Mobile phones are not allowed in the classroom. If any student found using the mobile phone, he/she has to pay Rs. 200 as fine in the account office.
- During lecture delivery, if you have any kind of query, just raise your hand. Queries are important for the understanding of the concepts. So, do ask queries but make sure they are relevant to the subject.
- Be disciplined in the classroom and don't make any noise while we are studying.

W3Professors

# SYLLABUS

## Internet Applications and Java

BC-501(N2)

**Max. Marks 100**

**Internal Assessment 40**

**External Assessment: 60**

### **Instructions for paper setter**

The question paper will consist of two sections A and B. Sections B will have Six questions and will carry 10 marks each. Section A will have 10 short answer type questions, which will cover the entire syllabus uniformly and will carry 20 marks in all.

### **Instructions for Candidates**

Candidates are required to attempt four questions from section B and the entire section A. Use of non-programmable scientific calculator is allowed

**Introduction:** Internet Architecture board, understanding the internet.

**Concept:** Working, Surfing and security on the internet.

Internet protocols Internet addressing, internet routing protocols internet message protocol, internet group management protocols, internet mail protocol.

**Internet applications:** E-mail, multi cost backbone, net news.

**Web:** World Wide Web advantages of web, web terminology, web access using web browser, locating information on the web.

**Introduction to Java:** Applets, application & JDK, different b/w Java & C++, working with Java objects: Encapsulation, inheritance & polymorphism, constructors. Garbage collection & finalisers, data types, modifiers & expressions, array & flow control statements. Exception handling threads, event handling, network programming & Java virtual machines, Java & databases.

### **REFERENCES:**

**1.Andews Staunebaum**

**2.Harley Haun**

**Computer Networks(Tata McGraw Hill)  
The Internet Complete Reference (PHI)  
Mastering Java (BPB Publications)**

**Practical S/W Lab –VIII**

**BC-506(N2)**

**Max. Marks 100**

**Internal Assessment 40  
External Assessment 60**

This paper will comprise of what is learnt under BC – 501 (Java Programming) and Practical on Internet access to:

- Create E-mail address
- Perform transactions
- Send and receive messages
- Use of search engines

**Note: The break up of marks for the practical will be as under**

<b>Lab Record</b>	<b>15 marks</b>
<b>Viva Voce</b>	<b>15 marks</b>
<b>Program development And execution</b>	<b>30 marks</b>

## COURSE BREAKUP

**SUBJECT NAME:** Introduction to Internet and Java  
**TEACHER CODE:** HS,RS,NKS,SRJ  
**NO. OF. LECT. :** 51

**SUBJECT CODE:** BC- 501(N2)  
**NO. OF TESTS:** 4  
**NO. OF ASSIGNMENTS:** 4

### THEORY BREAK UP

Proposed Week	Lect. No.	Lecture Content	Assignment	Test	DOD
1	1	Basic concepts of OOP,applications,Introduction to Java:Features of Java			
	2	Basic concepts of OOP,applications,Introduction to Java:Features of Java contd..			
	3	Applets,application & JDK, Difference between Java & C++			
	4	Internet architecture board,understanding internet,working			
2	5	Constants,variables,data types,scope of variables,symbolic constants,type casting,operators			
	6	java tokens,Java program structure,,java virtual machine			
	7	<b>Tutorial 1 Assignment 1</b>			
	8		<b>A1</b>		
3	9	Decision making and branching,decision making and looping			
	10	surfing and security on the internet, types of connections, Internet Resources			
	11	Introduction:defining class,adding variables,adding methods,creating objects,accessing class members			
	12	Constructors,method overloading(polymorphism),static members,nesting of methods			

4	13	Inheritance: defining a subclass, subclass constructor, multilevel inheritance			
	14	Internet protocols, addressing, modem			
	15	Hierarchical inheritance, Multiple Inheritance			
	16	<b>Tutorial 2</b>			
5	17	<b>Test 1</b>		<b>Test 1</b>	
	18	Overriding methods, final variables and methods, final classes, finalizer methods, abstract classes and methods, visibility control			
	19	Arrays: one dimensional, two dimensional, strings: methods, arrays, string buffer class			
	20	Internet routing protocols, Internet message protocols, Internet group management protocols, Internet mail protocol.			
6	21	Vectors, wrapper classes, packages: Java API packages, naming conventions, creating package, accessing & using package			
	22	Browsers, e-mail			
	23	Adding class to a package, hiding classes, Multithreading: creating threads, extending thread class contd..			
	24	stopping, blocking thread, life cycle of thread, using thread methods, thread exceptions			
7	25	<b>Assignment 2</b>	<b>A 2</b>		
	26	Thread priority, synchronization, runnable interface			
	27	Internet applications: E-mail, multi cost backbone			
	28	Errors and exceptions: types of errors, exceptions: try-catch statement, multiple catch statements			

8	29	finally statement,throwing our own exceptions,Applet programming:local and remote applets,Difference between applets and applications			
	30	building applet,applet life cycle,designing web page,applet tag,adding applet to HTML file			
	31	Running the applet,passing parameters to applets,aligning the display,displaying numerical values			
	32	net news,WWW,its advantages,web terminology, Portals			
9	33	<b>Test 2</b>		<b>Test 2</b>	
	34	Drawing arcs,polygons,file handling:stream classes,creation of files,reading-writing characters, getting input from user,drawing lines and rectangles,circles and ellipses			
	35	contd...			
	36	web accessing using web browser,locating information on the web (Searching via search and meta search engines			
10	37	Java and Databases			
	38	<b>Tutorial 3</b>			
	39	<b>Assignment 3</b>	<b>A 3</b>		
	40	Java and Databases contd...			
11	41	IRC, TELNET, FTP			
	42	Socket programming			
	43	Socket programming contd...			
	44	Socket programming contd...			
12	45	<b>Test 3</b>		<b>Test 3</b>	
	46	E-Commerce, Internet and job placements			
	47	Internet2, DNS & URL'S, Ip Telephony, Intranet, Extranet			
	48	<b>Assignment 4</b>	<b>A 4</b>		
13	49	Revision of entire Syllabus from Q.			

		Papers			
	50	Study of Java Eclipse			
	51	<b>Full Syllabi Test</b>		<b>Test 4</b>	

### PRACTICAL BREAK UP

Sr. No.	Name of Program
1.	Program to find the sum of two numbers
2.	Program to convert Fahrenheit temperature into Celsius temperature
3.	Program to find square root of a number
4.	Program to print sum of the series $1+1/2+\dots+1/10$
5.	Program that implements the basic functionality of a calculator
6.	Program to print prime numbers between 0 and 100
7.	Program to find the reverse of a number
8.	Program to find the sum of the digits of a number
9.	Program to find biggest of three numbers
10.	Program to calculate the compound interest
11.	Program to calculate the depreciation
12.	Program to print pattern <pre> 1 2 3 4 5 6 7 8 9 10 </pre>
13.	Program to print pattern <pre> 1 1 1 1 0 1 1 0 0 1 </pre>
14.	Program to print pattern <pre> 1 0 1 1 0 1 0 1 0 1 </pre>
15.	Program to print numbers divisible by 7 in between 100 and 200

16.	Program to find the roots of a quadratic equation
17.	Program to print pattern * * * * * * * * *
18.	Program to check whether a number is palindrome or not
19.	Program to display perfect numbers from 1 to 60
20.	Program to print sum of series $1+x+x^2+x^3+\dots+x^n$
21.	Program to print sum of series $1-(x/1! +x^2/2!+\dots+x^n/n!)$
22.	Program to check whether a number is Armstrong or not
23.	Program to convert a decimal no into binary, octal, hexadecimal
24.	Program to display pattern 1 1 1 1 2 1 1 3 3 1 1 4 6 4 1
25.	Program to display tables from 1 to 10 using 2d array
26.	Program to print next prime no.
27.	Program to search an element in an array
28.	Program to delete an element from array
29.	Program to calculate area and circumference of circle
30.	Program to calculate area of rectangle
31.	Program to count total no. of objects created for a class
32.	Program to find greatest of three no.s Numbers should pass through constructor
33.	Program to implement record of 5 students in 3 semesters and 3 tests per sem. and display the records
34.	A bookshop maintains the entries of books .Whenever a customer wants a book it gives message "Not available in stock" if value of stock =0 or gives details of book available Ask for no. of copies required and simultaneously update the stocks
35.	Imagine a tollbooth and a bridge .Cars passing by have to pay Rs. 50 Some cars passed by without paying the tax and some have to pay .Display msg 1.No. of cars passed by ,2.Total no. of cars who have not paid the tax and 3. Amount of cash collected
36.	An election is contested by 5 candidates which are numbered from 1 to 5 and voting is done by marking the candidate no.on ballot paper .WAP to count the no. of votes obtained by all the candidates
37.	Program to find the factorial of a number using recursion
38.	Program to perform merge sort
39.	Program to implement the concept of inheritance with the help of bank operation
40.	Program that illustrate the use of interfaces
41.	Program that implements the concept of multiple inheritance
42.	Program to handle three inbuilt exceptions
43.	Program to accept marks of a student in 5 subjects raise an exception if marks goes

	negative
44.	Program to illustrate all the methods of ArrayList class
45.	Program to illustrate the use of methods of String class
46.	Program to illustrate the use of methods of stack class
47.	Program to illustrate the use of methods of StringBuffer class
48.	Program to illustrate the use of methods of vector class
49.	Program to illustrate the use of LinkedList class
50.	Program to create a package that contains method to find square and cube of a number
51.	Program to create a package that contains a method to find reverse of a string
52.	Program to create a package that uses print.p statement to display any thing on screen
53.	Program to design an applet to draw a Bar Chart
54.	Program to design an applet to draw a square with different color lines
55.	Program to design an applet to draw circles with random colors
56.	Program to design an applet to draw a polygon
57.	Program to design an applet having 3 labels, textboxes and a button On the click of button change the color of rectangle according to values of textbox
58.	Program to design an applet that performs the basic functionality of a calculator
59.	Program to design an applet in which a smiley should be drawn on the click of a mouse
60.	Program to design an applet that consists of three scrollbars. On the change of the value of scrollbars the color of rectangle should change
61.	Program to design an applet of a smiley face
62.	Program to design an applet that fill multiple rectangles with different color
63.	Create an applet to handle double click of mouse
64.	Create an applet to handle mouse dragged option . Whenever you drag a mouse on applet it should display ovals
65.	Create an applet to draw your name at a distance of 10,20,30, pixels
66.	Create an applet to attach an image to a cursor and image should move along with cursor
67.	Create an applet to draw lines with circle of different colors wherever mouse moves
68.	Create an applet having two listboxes , one should be having list of fruits and second should be empty . There should be two buttons for shifting items from one listbox to another and vice versa
69.	Create an applet to make scientific calculator
70.	Create an applet that can display image animation 1) display different image on every move 2) display different image at one position whenever applet is loaded
71.	Program to play audio clip
72.	Program to copy one file to another byte by byte
73.	Program to copy one file to another character by character
74.	Create an applet to show the Flow Layout
75.	Create an applet to show the Border Layout

## ASSIGNMENT 1

State whether statements given are true or false and justify your answer: (9\*1=9)

1. Name of java program file must match name of the class having main method with extension java.
2. Two methods cannot have same name in Java.
3. Modulus operator works only on integer operands.
4. All the bitwise operators are having same precedence in Java.
5. When x is +ve then both expressions  $x \gg 2$  &  $x \gg \gg 2$  will give the same result.
6. One problem with OOP is that once a class is created it can never be changed.
7. The main emphasis of POP is on algo rather than on data.
8. One of the striking features of OOP is division of programs into objects to represent real world entities.
9. OOP approach cannot be used to create data bases.

Multiple choice questions: (10\*1=10)

1. Which of the following are invalid constants?  
a) 0.0001      b)  $5 * 1.5$       c) +100      d) -45.6  
e) "15.75"      f) 75.45E-2      g) RS 75.50      h) 0.000001234
2. Which of the following are invalid variable names and why?  
a) Minimum      b) first.Name      c)  $n1+n2$       d) doubles  
e) float      f) 3<sup>rd</sup>-row      g) sum Total      h) N\$  
i) Total-Marks
3. Which of the following represents a hexadecimal?  
a) 570      b)(hex)5      c) 0x9F      d) 0X5
4. Which of the following assignments are valid?  
a) float x=123.4  
b) long m=023;  
c) int n=(int>false;  
d) double y=0x786;
5. What is the default value of a char variable?  
a) '\u0020'      b) '\u00ff'      c) ""      d) '\u000'
6. Which of the following are correct?  
a) int a=16;  $a \gg 2 = 4$ ;  
b) int b=-8;  $b \gg 1 = -4$ ;  
c) int a=16;  $a \gg \gg 2 = 4$ ;  
d) int b=-8;  $b \gg \gg 1 = -4$ ;  
e) All of the above
7. Which of the following are not keywords?  
a) NULL      b) implements      c) protected      d) extended      e) string
8. Which of the following are the keywords?  
a) switch      b) integer      c) default      e) boolean      f) object
9. Which of the following keywords are used to control access to class members?

- a) default    b) abstract    c) protected    d) interface    e) public
10. Which of the following keywords are reserved but not used in initial versions of java are:
- a) union    b) const    c) inner    d) goto    e) boolean  
f) synchronized

Write the output of following questions and point out syntax errors if there are any: (6\*2=12)

- a) `byte x=64,y;`  
`y=(byte)(x<<2);`  
`System.out.println(y);`
- b) `byte b;`  
`double d=417.35;`  
`b=(byte)d;`  
`System.out.println(b);`
- c) `x=13 & 25;`  
`System.out.println(x);`
- d) `x=9 | 9;`  
`System.out.println(x);`
- e) `x=m%n;` (where m=5 and n=2)  
`System.out.println(x);`  
`x=m%n;` (where m=-14 and n=-3)
- f) `int x,m,n;`  
`x=++m + n++;`  
`System.out.println( " x is "+ x + " m is "+ m + " n is "+ n);`

11. Find out the errors, if any in the following declaration statements: (6\*1=6)

- a) `Int x;`  
b) `float length, HEIGHT;`  
c) `Character CI;`  
d) `Final int TOTAL;`  
e) `Final pi=3.142;`  
f) `Long int m;`

## ASSIGNMENT 2

Answer the following questions:

1. List a few areas of applications of OOP's Technology?
2. Why Java is called Platform neutral language?
3. Why Java is called Free Form language?
4. What are the various tools in java toolkit?
5. Draw a flowchart to show how java tools are used in an application development?
6. Write syntax for declaring constants?
7. Why java is often termed as an Internet language?
8. Given a value of variable write a statement without using if construct which will produce absolute value of a variable.
9. Write a program to subtract and multiply two 2-D matrix.
10. Why java is called a true object oriented programming language?
11. Difference b/w object oriented and object based language and give examples in support.
12. Write a program to print numbers divisible by 7 in between 100 and 200
13. Write a program to print sum of series  $1 - (x/1! + x^2/2! + \dots + x^n/n!)$
14. Write a program to check whether a number is Armstrong or not
15. Write a program to find whether a given number is palindrome or not .

### ASSIGNMENT 3

1. What is internet server and Internet Client?
2. What do you understand by headers?
3. What are the issues related in setting up a website?
4. Explain the concept of threads in detail with help of thread class and runnable interface programs.
5. What is a website and a home page?
6. How trojan horse attacks computer softwares?
7. How E-Mail is sent from a user to another?
8. Explain four layers of TCP/IP.
9. What is the relationship between a datagram and a packet?
10. Four differences between an applet and an application.
11. Write an applet to display a solid circle that fits perfectly inside the outline of a square.
12. Write a program that writes your phone number to a file as an int containing seven digit number.
13. Describe the handling of database in java with example.

## ASSIGNMENT 4

1. What are the differences between a repeater and a bridge.
2. What is difference between a switch and a hub?
3. Explain gateways and subnets.
4. Write a program to find whether a 2-D matrix contains negative number and at what portion using applet method.
5. Write a program in java to accept a string from user and convert its first letter to capital letter and display the string again.
6. Which are the three common kind of programs used in WWW?
7. Difference between ftp and http sites.
8. What are the issues related to database design?
9. Write a java program to update a telephone directory using a file.
10. How applet saves s/w from being attacked by the virus?

## ASSIGNMENT 5 (On Internet)

1. Media search is also called \_\_\_\_\_.
2. Write 5 features of ISP.
3. What is a dial up adapter? Where it can be used?
4. What are the tools available for web page designing?
5. What is the difference between Binary and Moderated News Groups?
6. What are web directories? and give 2 examples of web directories.
7. Write 2 functions of a web browser.
8. Describe various Internet Routing Protocols.
9. Describe various Internet Mailing Protocols.
10. List Internet Group Management Protocols.
11. What is multicast backbone?
12. What are net news protocols? Give examples also.
13. Describe the security implementation on internet.
14. How Proxy server works?
15. Explain the concept of IP addresses in detail.
16. Describe the privacy enhanced mail process.
17. What are the four features of Pretty Good Privacy?
18. Are internet and WWW different?
19. Explain Internet Architecture Board.
20. What is a cookie?
21. What is web portal?
22. How Netscape Navigator is good enough as compared to Internet Explorer?

## **Presentation Topics: (For Theory)**

1. Java in Mobile Technology
2. Sun Microsystem
3. Life without internet
4. Use of java in internet
5. Java - a true OOP
6. Wifi and WiMax
7. Internet Protocols
8. Java Applications and JDK
9. Comparison between C, C++ and Java
10. Data types in Java
11. Arrays in Java
12. Control Statements
13. Data mining
14. Neural Networks
15. Internet architecture board and working of internet