

**BCA 6<sup>th</sup> SEMESTER**  
**DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE)**  
**OPTION - I**

**BCA621C1: INTERNET TECHNOLOGIES**

**CREDITS: THEORY: 4; PRACTICAL: 2**  
**MAX. MARKS: THEORY: 60; PRACTICAL: 30**  
**MIN. MARKS: THEORY: 24; PRACTICAL: 12**

**THEORY: 60 LECTURES**

**UNIT-I**

Introduction to HTML Programming (5 lectures)

**Java**

Use of Objects, Array and ArrayList class

**JavaScript (10 lectures)**

Datatypes, operators, functions, control structures, events and event handling.

**TJNIT-II**

**JDBC (15 lectures)**

JDBC Fundamentals, Establishing Connectivity and working with connection interface, Working with statements, Creating and Executing SQL Statements, Working with Result Set Objects.

**UNIT-III**

**JSP (15 lectures)**

Introduction to JavaServer Pages, HTTP and Servlet Basics, The Problem with Servlets, The Anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC, Setting Up the JSP Environment, Implicit JSP Objects, Conditional Processing, Displaying Values, Using an expression to Set an Attribute, Declaring Variables and Methods, Error Handling and Debugging, Sharing Data Between JSP Pages, Requests, and Users, Database Access.

**UNIT-IV**

**Java Beans (15 lectures)**

Java Beans Fundamentals, JAR files, Introspection, Developing a simple Bean, Connecting to DB

**Recommended Books:**

1. Ivan Bayross, Web Enabled Commercial Application Development Using Html, Dhtml, javascript, Perl Cgi, BPB Publications, 2009.
2. Cay Horstmann, BIG Java, Wiley Publication, 3rd Edition., 2009
3. Herbert Schildt, Java 7, The Complete Reference, 8th Edition, 2009.
4. Jim Keogh, The Complete Reference J2EE, TMH, 2002.
5. O'Reilly, Java Server Pages, Hans Bergsten, Third Edition, 2003.

**LAB INTERNET TECHNOLOGIES (CREDITS: 2; LECTURES: 60)**

Create event driven program for following:

1. Print a table of numbers from 5 to 15 and their squares and cubes using alert.
2. Print the largest of three numbers.
3. Find the factorial of a number n.
4. Enter a list of positive numbers terminated by Zero. Find the sum and average of these numbers.
5. A person deposits Rs 1000 in a fixed account yielding 5% interest. Compute the amount in the account at the end of each year for n years.

Read n numbers. Count the number of negative numbers,

Positive numbers and zeros in the list.

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**OPTION - II**

**BCA620D1B: PYTHON PROGRAMMING**

**CREDITS: THEORY: 4; PRACTICAL: 2**  
**MAX. MARKS: THEORY: 60; PRACTICAL: 30**  
**MIN. MARKS: THEORY: 24; PRACTICAL: 12**

**UNIT I: Introduction to Python: (3 Lectures)**

Structure of a Python Program, Atoms, Identifiers and keywords, Elements of Python; Python Interpreter, Using Python as calculator, Python shell, Indentation.

**Built in Data Types: (10 Lectures)**

Numbers: Literal representations of numbers, Operators for numbers, Methods on numbers; Lists: Literal representation of lists, Operators on lists, Methods on lists, List comprehensions; Strings: Characters, Operators on strings, Methods on strings, Raw strings, Unicode strings; Dictionaries: Literal representation of dictionaries, Operators on dictionaries, Methods on dictionaries; Files; None; The booleans True and False.

**Operators: (2 Lectures)**

Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator).

**UNIT II: Statements: (15 Lectures)**

Assignment statement; Input and Output Statements, Print statement; Control statements: if: statement; for: statement; while: statement (Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass.). Exceptions and the try: except: and raise statements.

**UNIT III: Functions (15 Lectures)**

Optional arguments and default values; Passing functions as arguments; Extra args and keyword args; Order of arguments (positional, extra, and keyword args; Functions and duck typing and polymorphism; Recursive functions; Generators and iterators.

**UNIT IV: Object Oriented Programming and classes (15 Lectures)**

Constructor; Inheritance Implementing a subclass; Classes and polymorphism; Recursive calls to methods; Class variables, class methods, and static methods; Decorators for class method and static method.

**Reference Books:**

1. T. Budd, Exploring Python, TMH, 1 st Ed, 2011
2. Python Tutorial/Documentation [www.python.org](http://www.python.org) 2015
3. Allen Downey, Jeffrey Elkner, Chris Meyers, How to think like a computer scientist: learning with Python, Freely available online.2012
4. <http://docs.python.Org/3/tutorial/index.html>
5. <http://interactivepython.org/courselib/static/pythonds>
6. <http://www.ibiblio.org/g2swap/byteofpython/read/>

**Section: A (Simple programs):**

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users choice.
2. WAP to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria:  
 Grade A: Percentage  $\geq 80$  Grade B:  
 Percentage  $\geq 70$  and  $< 80$  Grade C: Percentage  $\geq 60$   
 and  
 $< 70$  Grade D:  
 Percentage  $\geq 40$  and  $< 60$  Grade E: Percentage  $< 40$
3. Write a menu-driven program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. WAP to display the first n terms of Fibonacci series.
5. WAP to find factorial of the given number.
6. WAP to find sum of the following series for n terms:  $1 - 2/2! + 3/3! \dots \dots \dots n/n!$
7. WAP to calculate the sum and product of two compatible matrices.

**Section: B (Visual Python):**

All the programs should be written using user defined functions, wherever possible.

1. Write a menu-driven program to create mathematical 3D objects
  - I. curve
  - II. sphere
  - III. Cone
  - IV. arrow
  - V. ring
  - VI. cylinder
2. WAP to read n integers and display them as a histogram.
3. WAP to display sine, cosine, polynomial and exponential curves.
4. WAP to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered by the user.
5. WAP to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula  $m=60/(t+2)$ , where t is the time in hours. Sketch a graph for t vs. m, where  $t \geq 0$ .
6. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows:  

$$P(t) = (15000(1+t))/(15+e)$$
 Where the time t is measured in hours. WAP to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval.
7. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:
  - I. velocity wrt time ( $v=u+at$ )
  - II. distance wrt time ( $s=u*t+0.5*a*t*t$ )
  - III. distance wrt velocity ( $s=(v*v-u*u)/2*a$ )  
 WAP to show a ball bouncing between 2 walls. (Optional)