

TUMKUR UNIVERSITY



**Syllabus as per CBCS 2016-2017 under
Semester Scheme**

Computer Science

(B.Sc. DEGREE)

5th and 6th Semester

FIRST SEMESTER

BSCsT1.1: Computer concepts & OOPs using C++

BSCsP1.2: OOPs using C++ Lab

SECOND SEMESTER

BSCsT2.1: Data Structure Using C++

BSCsP2.2: Data Structure lab

THIRD SEMESTER

BSCsT3.1: Operating System & UNIX

BSCsP3.2: UNIX LAB

FOURTH SEMESTER

BSCsT4.1: Software Engineering&Database Management System

BSCsP4.2: DBMS lab using MySQL

FIFTH SEMESTER

BSCsT5.1: Java Programming

BSCsP5.2: Java programming lab

BSCsT5.3: Web technology

BSCsP5.4: Web Design Lab

SIXTH SEMESTER

BSCsT6.1: PythonProgramming

BSCsP6.2: Python Programming Lab

BSCsT6.3: Computer Networks

BSCsP6.4: Project

Computer Science (B.Sc DEGREE)
Revised Syllabus -2016
ABSTRACT

Sem	Paper Code	Paper Name	Hrs / week	Exam Hrs	MAX.MARKS		
					Int. Marks	Ext. Marks	Total
V	BSCsT5.1	Java Programming	03	03	10	90	100
	BSCsP5.2	Java programming lab	03	03	-	50	50
	BSCsT5.3	Web technology	03	03	10	90	100
	BSCsP5.4	Web Design Lab	03	03	-	50	50
VI	BSCsT6.1	PythonProgramming	03	03	10	90	100
	BSCsP6.2	Python ProgrammingLab	03	03	-	50	50
	BSCsT6.3	Computer Network	03	03	10	90	100
	BSCsP6.4	Project	03	03	-	50	50

Question Paper Pattern

Duration: 3 Hrs.

Max. Marks: 90

- | | |
|--|----------------|
| I. Answer any 10 Questions out of 12: | (10 x 01 = 10) |
| II. Answer any 5 questions out of 07: | (05 x 03 = 15) |
| III. Answer any 6 questions out of 08: | (06 x 05 = 30) |
| IV. Answer any 5 questions out of 07: | (05 x 07 = 35) |

Scheme for Practical Examination

- | | | |
|------------------------------|---|------------------|
| 1. Writing two programs | : | 10 Marks |
| 2. Execution of two programs | : | 30 Marks |
| 3. Practical record | : | 05 Marks |
| 4. Viva Voce | : | 05 Marks |
| Total | | :50 Marks |

Note

- | | | |
|---|-----------|-------------------|
| 1. Internal assessment for each paper(Theory) | :10 Marks | |
| 2. Practical examination of 3 hours duration | :50 Marks | |
| 3. Theory examination of 3 hours duration | :90 Marks | |
| Total | | :150 Marks |

**V Semester Syllabus
Theory**

BSCsT5.1: Java Programming

3 Hrs/Week

Total Hrs: 48

❖ Chapter 1: Fundamentals Of Oops & Overview of Java Language **5 Hrs**

Introduction, Object Oriented paradigm, Basic Concepts of OOP, Benefits of OOP, Applications of OOP, Java features: OVERVIEW OF JAVA LANGUAGE: Introduction, Simple Java program structure, Java tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command line arguments.

❖ Chapter 2: Programming Basics **10 Hrs**

Constants, variables & data types: Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Value to Variables, Scope of variables, Symbolic Constants, Type casting, Getting Value of Variables, Standard Default values.

Operators & Expressions: Arithmetic operators, bitwise operators, relational operators, assignment operator, ternary operator. Logical expression.

Decision making & Branching: Introduction, Decision making with if statement, Simple if statement, if. Else statement, Nesting of if else statements, the else if ladder, the switch statement, the conditional operator. LOOPING: Introduction, The While statement, the do-while statement, the for statement, Jumps in loops.

❖ Chapter 3: Classes, Objects & Methods **5 Hrs**

Introduction, Defining a class, Adding variables, Adding methods, Creating objects, Accessing class members, Constructors, Method overloading, Static members, Nesting of methods;

❖ Chapter 4: Inheritance Interfaces and Packages **10 Hrs**

Extending a class, Overriding methods, Final variables and methods, Final variables, methods and classes, Finalizer method, Abstract methods and classes; Arrays, Strings and Vectors: Arrays, One-dimensional arrays, Creating an array, Two – dimensional arrays, Strings, Vectors, Wrapper classes;

Interfaces: Multiple Inheritance: Introduction, Defining interfaces, Extending interfaces, Implementing interfaces, Assessing interface variables;

Packages: Introduction, Java API Packages, Using System Packages, Naming conventions, Creating Packages, Accessing a Package, using a Package.

❖ Chapter 5: Multithreaded Programming& Exception **5 Hrs**

Introduction, Creating Threads, Extending the Threads, Stopping and Blocking a Thread, Lifecycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority, Synchronization, Exception: Types of errors-Compile time errors,

Runtime errors, Exceptions, Exception handling, Multiple Catch Statements, Using finally statement, Throwing our own Exception.

❖ **Chapter 6: Applet & Graphics Programming**

13Hrs

Local and remote applets, Applets and Applications, Building Applet code, Applet Life cycle: Initialization state, Running state, Idle or stopped state, Dead state, Display state.

Graphics Programming: Introduction, The Graphics Class, Lines and rectangles, circles, and Ellipses, Drawing Arcs, Drawing Polygons, Lines Graphs, Using Control Loops in Applets, Drawing Bar Charts.

AWT classes, window fundamentals, creating frame window and handling events, working with graphics, working with colour, working with fonts, understanding layout managers, menu bars and menus, dialog boxes.

Reference Books:

1. E. Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw-Hill Company.
2. Herbert Schildt: Java The complete Reference , 7th Edition, Tata McGraw Hill, 2007.
3. Programming in Java by Sachin Malhotra, OXFORD University Press
4. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TATA McGraw-Hill Company.
5. Deitel & Deitel. Java TM: How to Program, PHI (2007)
6. Java Programming: From Problem Analysis to Program Design- D.S Mallik

**BSCsP5.2: Java Programming Lab
Practical**

3 Hrs/Week

Total Marks: 50

1. Write a Java program to find the GCD of number.
2. Write a JAVA Program to demonstrate Constructor for calculating area of rectangle.
3. Write a JAVA Program to demonstrate Method Overloading.
4. Write a program in Java for String handling which performs the following:
i) Reverses the contents of a string given on console and ii) converts the resultant string in upper case.
5. Write a JAVA Program on interfaces to calculate the area of a rectangle and triangle.
6. Write a JAVA Program to Design a simple calculator using Switch Statement
7. Write a program to calculate area and perimeter of a rectangle using Super keyword.
8. Write a program to sort given Strings.
9. Design student application form and store in database and display.
10. Write a java applet program to print some text.
11. Write a java applet program to understand the properties of the font.
12. Write a java applet program to demonstrate the drawing function (draw lines, rectangle, ellipse and circle).

V Semester
BSCsT5.3: Web Technology

3Hrs/Week

Total Hrs: 48

❖ **Chapter 1: Introduction to HTML**

14 Hrs

Internet, Intranet, WWW, web browsers , web servers, Search engines, DNS, URLs,HTTP, CGI, Internet Security.

Introduction to HTML: Introduction to HTML, Elements of HTML syntax, Head and Body sections, Building HTML documents, Inserting text, images, hyperlinks, Backgrounds and Color Control, meta tags, ordered and unordered lists, Table Handling: Table layout & presentation, constructing tables in a web page, Frames: Developing Web pages using frames. Forms and its elements.

❖ **Chapter 2: Introduction to CSS**

6 hrs

CSS: Introduction, Levels of style sheets, Style specification formats, Selector forms, Property value forms, Font properties, List properties, Color, Alignment of text, The Box model, Background images, Conflict resolution.

❖ **Chapter 3: Introduction to Java Script**

8 hrs

Overview of JavaScript; General syntactic characteristics; Primitives operations and expressions; Screen output and keyboard input; Control statements Events and event handling; Handling events from the Body elements, Button elements, Text box and Password elements.

❖ **Chapter 4: Introduction to PHP**

20 Hrs

History, Advantages of PHP, The HTML relationship, Interpreting vs. Compiling. Basic syntax – Data Types - Variables - Constants - Expressions - Operators - Control Structures: sequence, condition statements, loops, jump statements, Arrays: Arrays, Multidimensional arrays, Associative arrays, Strings, basic operations on strings. Functions Overview, Designing and Handling form, \$_GET, \$_POST, \$_REQUEST, \$_SESSION VARIABLES , Database Connections -Using MySQL with PHP, Performing basic database operation(DML) (Insert, Delete, Update, Select) Aggregate Functions(sum, avg, count), Reading auto-incrementing values. File Uploading – File Downloading through Form.

Reference Books:

1. Robert W. Sebesta: Programming the World Wide Web, 4th Edition, Pearson Education, 2008 (chapters 1 to 9)
2. Web programming: Srikanth S, Skyward Publishers.
3. www.w3schools.com

BSCsP5.4: Web Technology Lab

3Hrs/Week

Total Marks: 50

1. Write a HTML code to create simple Web page to display your college information.
2. Write a HTML code to create different types of ordered lists.
3. Write a HTML code to insert an image of 'Tim Berners Lee' and display his Bio data.
4. Write a HTML code to embed multimedia on to a web page.
5. Write a HTML code to create your class time table.
6. Write a HTML code to create a form to accept student details. When the form runs in the Browser fill the textboxes with data. Write JavaScript code that verifies that all textboxes has been filled. If a textboxes has been left empty, popup an alert indicating which textbox has been leftempty
7. Write a PHP program to create and manage a database using SQL commands.
8. Write a PHP program to create and validate a email id.
9. Using PHP and SQL, create and validate a sample login form.
10. Using PHP and SQL, develop a program to accept student information viz. Accession name, regno, course, sem, marks in 3 subjects from a web page and store the information in a database and to calculate total and average and to display the results with proper headings.
11. Using PHP and SQL, develop a program to accept employee information viz. Accession no, name and basic from a web page and store theInformation in a database and to calculate DA, HRA, PF, TAX, Gross and net payand to display the details with proper headings.

VI Semester

BSCsT6.1: Python Programming Theory

3 Hrs/Week

Total Hrs: 48

- ❖ **Chapter 1: Python Programming basics:** **8 Hrs**
Introduction to Python ,features ,Structure of a Python Program, Elements of Python, Interpreter, Python shell, Indentation, Identifiers and keywords, Data types, Literals, Strings-operations on strings, Operators (Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment and Decrement operator).
- ❖ **Chapter 2: Creating Python Programs:** **16Hrs**
Input and Output Statements, Control statements (Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass,Iteration and Recursion.), Tables- Two-dimensional tables, Functions- Defining Functions, default arguments, Profiling, Modules- Defining and Creating, exploring, importing of modules, Arrays, Lists–operation on lists, set and Dictionaries, pattern matching and searching using regular expression.File handling and I O methods, Errors and Exceptions handling, Threads-Understanding threads, Forking threads, synchronizing the threads, Programming using multithreading.
- ❖ **Chapter 3: Object Oriented Programming:** **8Hrs**
Introduction to Classes, Objects and Methods, Constructor, class attributes and destructors overlapping and overloading, Inheritance. Namespaces and Packages in Python
- ❖ **Chapter 4: Databases:** **8 Hrs**
Creating database, Database connection, use of DDL, DML, DTL commands.
- ❖ **Chapter 5:GUI Programming and Graphics:** **8 Hrs**
HTMLPrerequisites-Basic GUI construction-Form elements-Textbox, Label, Button, Checkbox, list, Option - python integration with web forms.Graphics introduction sample graphics programming-pie chart,bar chart, histograms

Reference:

1. Practical Programming- An Introduction To Computer Science Using Python:ByjenifferCampbell,Paulgries,Jasonmanioja
2. T. Budd, Exploring Python, TMH, 1st Ed, 2011
3. Python Tutorial/Documentation www.python.org
4. Allen Downey, Jeffrey Elkner, Chris Meyers.How to think like a computer scientist learning with Python / 1st Edition,2012 – Freely available online.
5. <http://docs.python.org/3/tutorial/index.html>

BSCsP6.2: PYTHON PROGRAMMING LAB

Practical

3 Hrs/Week

Total Marks: 50

1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2. Program 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 ≥ 80
Grade B: Percentage ≥ 70 and < 80
Grade C: Percentage ≥ 60 and < 70
Grade D: Percentage ≥ 40 and < 60
Grade E: Percentage < 40
3. Program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. Program to generate Pythagorean triplets.
5. Program to display the first n terms of Fibonacci series.
6. Program to check whether a given number is Armstrong number or not.
7. Program to find sum of the following series for n terms: $1 - \frac{2}{2!} + \frac{3}{3!} - \dots - \frac{n}{n!}$
8. Program to calculate the sum of two compatible matrices.
9. Program to calculate the product of two compatible matrices.
10. Program to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula $m = \frac{60}{(t+2)}$, where t is the time in hours. Sketch a graph for t vs. m, where $t \geq 0$.
11. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows: $P(t) = \frac{15000(1+t)}{(15+e^t)}$ 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.
12. 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 ($s = ut + 0.5at^2$)
 - III. distance wrt velocity ($s = \frac{v^2 - u^2}{2a}$)
13. A population of 1000 bacteria is introduced into a nutrient medium. The population p grows as follows: $P(t) = \frac{15000(1+t)}{(15+e^t)}$ 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.

VI Semester
BSCs6.3: Computer Network

3Hrs/Week

Total: 48 Hrs

- ❖ **Chapter 1 : DATA COMMUNICATIONS** **8 Hrs**
Networks–Components: Data Representation, need of network, services. Network models-peer to peer, client server, distributed. Application of network and criteria, Types of connections: Topologies-mesh, star, bus, ring, Categories of Networks -LAN, WLAN, MAN, WAN.
- ❖ **Chapter 2: Protocols and standards** **10 Hrs**
Protocols and standards – standards Organizations – internet standards – internet administration - The OSI model and the TCP/IP protocol suit: the OSI model – layers in the OSI model – TCP/IP protocol suit – addressing – IP versions
- ❖ **Chapter 3: Application layer** **6 Hrs**
Domain Name System, Domain Name Space, Tree Structure, TLD,SMTP, FTP,TFTP,HTTP,Telnet- Architecture-Remote Login – WWW –Introduction to Socket- Introduction to Security –cryptography. The Future of TCP / IP.
- ❖ **Chapter 4: Data link layer** **6 Hrs**
Error detection and correction –Parity checking, Checksum, CRC, Hamming Codes,Flow-control and error control- Sliding window – HDLC-LAN – Ethernet IEEE 802.3 – IEEE 802.4 – IEEE 802.5 – IEEE 802.11 – FDDI – SONET – Bridges.
- ❖ **Chapter 5: Network layer-Internetworks** **6 Hrs**
Packet switching and datagram approach – IP addressing methods- AddressClasses.Subnetting – Routing-Routing model, Algorithm– Routing table – Routers.IPV4 and IPV6 format.
- ❖ **Chapter 6: Transport layer** **6 Hrs**
Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) Transmission Control Protocol (TCP) –Port Numbers– Congestion Control – Quality of Services (QOS)
- ❖ **Chapter 7: Modern Wireless Communication Systems** **6 Hrs**
Wireless Networks Generation -Wireless Transmission Protocols- Wired Vs Wireless Networks Present Day Mobile Communication-The Cellular Fundamentals-Transmitter and Receiver Techniques

Reference Book

1. TCP/IP Protocol Suit by Behrouz A. Forouzan Tata McGraw-Hill Third Edn.
2. Mobile computing by Rajkamal, Oxford University Press
3. JochenSchillr - Mobile Communication, Addison Wesley, 2000.
4. Behrouz A. Forouzan, –Data communication and Networking, Tata McGraw Hill, 2004.
5. Andrew S. Tanenbaum, –Computer Networks, 4th Edition, Prentice Hall of India, 2003.
6. Douglas E.Comer, “Internetworking with TCP / IP – Principles, Protocols and Architectures, Fourth Edition, Prentice – Hall of India Private Limited, 2002.

BSCsP6.4 Project Lab

3 Hrs/Week

Total Marks: 50

Guidelines:

- The aim of the Project work is to acquire practical knowledge on the implementation of the programming concepts studied.
- Project should be carried out in batch with minimum of three and maximum of five students, and it may be a work using the software packages that they have learned or the implementation of Concepts from the papers studied or implementation of any innovative idea.
- The Project work should be compulsorily done in the college under the supervision of the concerned department staff.

University Exam will be conducted as follows.

- Viva-voce will be conducted at the end of VI semester for 50 marks.
- Both the Examiners (50%+50%) should conduct the Viva-Voce Examination during practical session. Out of 50 marks, 25 for Project Evaluation and 25 for Viva. For awarding a pass, a candidate should have obtained 40% of the Total 100 marks.
- Report should be in A4 paper & book binding with the following table of contents
 - 1) Certificate
 - 2) Acknowledgement
 - 3) Synopsis
 - 4) Contents
 - 5) About the project
 - 6) Analysis
 - 7) Design
 - a. DFD
 - b. ER Diagram
 - 8) Coding
 - 9) Testing
 - 10) Reports/output
 - 11) Conclusion
 - 12) Bibliography

Scheme for Practical (Project) Examination

1. Writing about project	:	10 Marks
2. Demonstration of Project	:	30 Marks
3. Project Report	:	5 Marks
4. Viva Voce	:	5Marks
Total	:	50 Marks

Note

1. Internal Assessment for each paper(Theory)	:	10 Marks
2. Practical Examination of 3 hours duration	:	50 Marks
3. Theory Examination of 3 hours duration	:	90 Marks
Total	:	150 Marks