

# **TUMKUR UNIVERSITY**



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

### **Bachelor of Computer Applications (BCA)**

**Computer Science (BCA)**

**FIRST SEMESTER**

BCACsT1.1: Programming concepts using C.  
BCACsP1.2: C programming lab  
BCACsT1.3: Operating system  
BCACsP1.4: DOS&Ms-office lab  
BCACsT1.5: Computer Hardware and Networking  
BCACsP1.6: Computer Hardware Lab

**SECOND SEMESTER**

BCACsT2.1: Database management systems  
BCACsP2.2: DBMS lab  
BCACsT2.3: Digital electronics  
BCACsP2.4: Digital electronics lab  
BCACsT2.5: Data structure using C  
BCACsP2.6: Data structures using C lab

**THIRD SEMESTER**

BCACsT3.1: Computational Numerical Techniques  
BCACsP3.2: Numerical analysis lab  
BCACsT3.3: Object oriented programming using C++  
BCACsP3.4: C++ using oops lab  
BCACsT3.5: Internet Programming  
BCACsP3.6: HTML & XML lab

**FOURTH SEMESTER**

BCACsT4.1: Computer networks and data communication  
BCACsP4.2: Static website project lab  
BCACsT4.3: UNIX operating system  
BCACsP4.4: UNIX lab  
BCACsT4.5: ADA  
BCACsP4.6: ADA lab

**FIFTH SEMESTER**

BCACsT5.1: Core JAVA  
BCACsP5.2: JAVA programming Lab  
BCACsT5.3: DOT NET with C#  
BCACsP5.4: DOT NET Lab  
BCACsT5.5: Computer architecture  
BCACsP5.6: Micro processor Lab  
BCACsT5.7: Software Engineering  
BCACsP5.8: DBMS Mini Project  
BCACsT5.9: PHP and MySQL  
BCACsP5.10: PHP LAB  
BCACsT5.11: Data Mining  
BCACsP5.12: SDLC Lab

**SIXTH SEMESTER**

BCACsT6.1: Programming using Python  
BCACsP6.2: Python Lab  
BCACsT6.3: MIS and ERP  
BCACsP6.4: Tally Lab  
BCACsT6.5: Cryptography & Network Security  
BCACsP6.6: Computer Network Lab  
BCACsT6.7: Computer Graphics  
BCACsP6.8: Computer Graphics Lab  
BCACsT6.9: System Software  
BCACsP6.10: SSPD Lab  
BCACsT6.11: Artificial Intelligence  
BCACsP6.12: Project lab

**Computer Science (BCA) 5<sup>th</sup> and 6<sup>th</sup> Semester Syllabus -2016  
ABSTRACT**

SE M	PAPER CODE	PAPER NAME	HRS / WEEK	EXAM HRS	MAX.MARKS		
5	BCACsT5.1	Core JAVA	03	03	10	90	100
	BCACsP5.2	JAVA programming Lab	03	03	-	50	50
	BCACsT5.3	DOT NET with C#	03	03	10	90	100
	BCACsP5.4	DOT NET Lab	03	03	-	50	50
	BCACsT5.5	Computer architecture	03	03	10	90	100
	BCACsP5.6	Micro processor Lab	03	03	-	50	50
	BCACsT5.7	Software Engineering	03	03	10	90	100
	BCACsP5.8	DBMS Mini Project	03	03	-	50	50
	BCACsT5.9	PHP and MySQL	03	03	10	90	100
	BCACsP5.10	PHP LAB	03	03	-	50	50
	BCACsT5.11	Data mining	03	03	10	90	100
	BCACsP5.12	SDLC lab	03	03	-	50	50
6	BCACsT6.1	Programming using Python	03	03	10	90	100
	BCACsP6.2	Python Lab	03	03	-	50	50
	BCACsT6.3	MIS and ERP	03	03	10	90	100
	BCACsP6.4	Tally Lab	03	03	-	50	50
	BCACsT6.5	Cryptography & Network Security	03	03	10	90	100
	BCACsP6.6	Computer Network Lab	03	03	-	50	50
	BCACsT6.7	Computer Graphics	03	03	10	90	100
	BCACsP6.8	Computer Graphics Lab	03	03	-	50	50
	BCACsT6.9	System Software	03	03	10	90	100
	BCACsP6.10	SSPD Lab	03	03	-	50	50
	BCACsT6.11	Artificial Intelligence	03	03	10	90	100
	BCACsP6.12	Project lab	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**

**5<sup>th</sup>Sem BCA**

**Paper: BCACsT5.1: Core JAVA**

**3Hrs /Week**

**Total: 48Hrs**

❖ **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 color, 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 , 7<sup>th</sup> 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

**5<sup>th</sup>Sem BCA**

**Paper: BCACsP5.2: JAVA PROGRAMMING LAB**

**Practical**

**3Hrs/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).

**5<sup>th</sup>Sem BCA**

**Paper: BCACsT5.3: Dot Net With C#**

**3Hrs /Week**

**Total: 48Hrs**

**Chapter 1: Getting started with .NET Framework**

**(5 Hours)**

Dot Net Framework: basic concepts of .net framework: MSIL, JIT, CLR, CLS, Execution, Assemblies, and Application Domain. Features of C#, Intermediate language, Meta Data. DOT NET namespaces.

Building C# Applications: Role of the command line compiler (csc.exe), Building a C# application using csc.exe, the command line debugger (cordbg.exe), using the visual studio .NET IDE & its debugging

**Chapter 2: Introduction to C#**

**(10Hours)**

C# Consoleprogramming: Structure of C# program: name space, types, value type, simple type, reference type, boxing and unboxing, and their conversions. Variables & parameters, implicit conversion, explicit conversion and user-defined conversion. Expressions: Expressions, types of expressions, C# operators: arithmetic operators, shift operators, logical operators, conditional operators, conversion operators, checked& unchecked operators. Control statements: sequence, Conditional statements, loops, jumping statements. Arrays & Collections: Introduction to arrays, Declarations and its types. Introduction to collection, Array list, jagged array, stack implementation.

**Chapter 3: Object oriented programming:**

**(05 Hours)**

Class & Methods: Class, declarations, class modifiers, constructors & destructors, new modifier. Methods, method parameters, abstract class, sealed class, access modifiers, method overloading.

**Chapter 4: Inheritance & Interfaces**

**(08 Hours)**

Inheritance: introduction, types, base class inheritance, derived class inheritance. Virtual methods, method overriding. Interface: Interface, declaration modifiers, methods, properties, events. Exception Handling: Definition, Exception handling techniques (statements), types, creating our own exception class. Multi-Threading

**Chapter 5: Windows Applications**

**(10 Hours)**

Windows Forms-Common Controls, Control Properties and Layout, Labels, TextBoxes and Buttons, GroupBoxes and Panels, CheckBoxes and RadioButtons, ToolTips, Mouse-Event Handling, Keyboard-Event Handling. Menus, Month Calendar Control, LinkLabel Control, ListBox Control, ComboBox Control, TreeView Control, ListView Control, TabControl and Multiple Document Interface (MDI) Windows and Delegates: Introduction, types, multi-cast delegates.



**Chapter 6: ADO.net:**

**(10 Hours)**

Components of ADO.net, Understanding ADO.NET: Describing the Architecture of ADO.NET, Connection Strings: Syntax for Connection Strings. Working with Connection Object: Creating a Connection to a Database: SQL Server Database, OLEDB Database, Creating a Command Object. Inserting, Updating and Deleting Records. Working with Data Adapters: Creating DataSet from DataAdapter.

**Reference Books:**

1. ASP.NET 4.0 Black Book
2. Andrew Troelsen: Pro C# with .Net 3.0, 4th Edition, Wiley India, 2009.
3. E.Balaguruswamy: Programming in C#, 2nd Edition, Tata McGraw Hill, 2008.
4. Tom Archer: Inside C#, WP Publishers, 2001.
5. Herbert Schildt: C# The Complete Reference, Tata McGraw Hill, 2004.

**5<sup>th</sup>Sem BCA**  
**Paper: BCACsP5.4: Dot NET LAB**  
**PRACTICAL**

**3Hrs /Week**

**50 Marks**

1. Write a Program in C# to Check whether a number is Palindrome or not.
2. Write a Program in C# to demonstrate Command line arguments processing.
3. Write a Program in C# to find the roots of Quadratic Equation.
4. Write a Program in C# to demonstrate boxing and unBoxing.
5. Write a Program in C# to implement Stack operations.
6. Write a program to demonstrate Operator overloading.
7. Write a Program in C# to find the second largest element in a single dimensional array.
8. Write a program to reverse a given string using C#.
9. Using Try, Catch and Finally blocks write a program in C# to demonstrate error handling.
10. Design a simple calculator using Switch Statement in C#.
11. Demonstrate Use of Virtual and override key words in C# with a simple program
12. Implement linked lists in C# using the existing collections name space.
13. Write a program to demonstrate abstract class and abstract methods in C#.
14. Write a program to illustrate the use of different properties in C#.
15. Demonstrate arrays of interface types with a C# program.

**5<sup>th</sup>Sem BCA**

**Paper: BCACsT5.5: Computer Architectures**

**3Hrs /Week**

**Total: 48Hrs**

❖ **Chapter-1 Introduction to Computer Organization and Architecture 12hrs**

Computer-Definition and Block Diagram, Organization and architecture, Von Neumann Architecture, Designing for performance, Pentium & PowerPC Evolution. Computer component and Function: Basic instruction cycle, Fetch & Execute cycle, Interrupts, Instruction Cycle with Interrupts, Multiple Interrupts, I/O functions, Interconnection Structures, Processor bus organization, Bus Interconnection-Bus structure, System bus structure, (Data, address and control bus), Elements of Bus design. Advance Architecture- Parallel Processing, RISC and CISC Characteristics.

❖ **Chapter-2 The Memory Subsystem 6hrs**

Memory system overview, Memory hierarchy, Semiconductor main memory, Basic concepts, RAM (Static and Dynamic), ROM (PROM, EPROM, EEPROM, FLASH MEMORY), Memory Module organization Cache memory – Principle, elements of cache design (Size, Mapping, Replacement, Write policies, Block size), Error detecting & correcting code, External Memory-Magnetic, Optical and RAID.

❖ **Chapter-3 The Input/output Subsystem 5 hrs**

Introduction- Access of I/O devices, I/O Modules (Functions and Structures), Programmed I/O, Overview of Interrupt driven I/O, Comparisons of Programmed & Interrupt I/O, Direct Memory Access - DMA Functions, I/O channels and processor.

❖ **Chapter-4 The Central Processing Unit 5 hrs**

Arithmetic logic unit (ALU): instruction formats, addressing modes, data transfer and manipulation, program control, microprocessor organization. Computer Arithmetic: Integer representation and Arithmetic. Floating point representation and Arithmetic.

❖ **Chapter-5 Assembly Language Programming using 8085 20 hrs**

Introduction to Microprocessors, Overview of Intel 8085 Basic microprocessors, architecture and interface, internal architecture, external architecture memory and input/ output interface. Assembly language, Assembler, Assembly level instructions, program loops, Addressing modes and formats, Data movement, Arithmetic and logic instructions, Control instructions.

**REFERENCE BOOKS**

- 1 Carl Hamacher, Zvonko Varnesic, Swaft Computer Organization 5<sup>th</sup> edition, Tata McGraw-Hill
2. William Stallings, Computer Organisation and Architecture, Pearson Education
- 3 Andrew S. Tanenbaum, Structured Computer Organization, 3rd Edition ; Prentice Hall of India.
- 4 Heuring and Jordan, Computer Systems Design and Architecture, Pearson Edition
- 5 R.S. Gaonkar, "Microprocessor Architecture, programming and Applications with the 8085/8080A", Wiley Eastern Ltd. 2. 1995
- 6 Fundamentals of Microprocessors and Micro Computers", B Ram Dhanpath Rai Publications

**5<sup>th</sup>Sem BCA**  
**Paper: BCACsP5.6: MICRO PROCESSOR LAB**  
**Practical**

**3Hrs/Week**

**Total Marks: 50**

1. Program to find addition of two 8-bit numbers
2. Program to find subtraction of two 8-bit numbers
3. Program to find addition of two 16-bit numbers
4. Programs to find subtraction of two 16-bit numbers
5. Program to find addition of two 8-bit BCD numbers
6. Program to find subtraction of two 8-bit BCD numbers
7. Program to find multiplication of two 8-bit numbers using successive addition method.
8. Program to find multiplication of two 8-bit numbers using shift and add method
9. Program to convert two BCD numbers to their HEX equivalent
10. Program to swap two numbers
11. Program to find largest and smallest of two numbers.

**5<sup>th</sup>Sem BCA**

**Paper: BCACsT5.7: SOFTWARE ENGINEERING**

**3 Hrs /Week**

**Total: 48 Hrs**

**❖ Chapter - 1 Introduction: 10 Hrs**

Definition of Software, Software Engineering, Software Products and Software process, Process models: Waterfall modal, Evolutionary Development, Bohemia's Spiral model, Overview of risk management, Process Visibility, Professional responsibility. Computer based System Engineering: Systems and their environment, System Procurement, System Engineering Process, System architecture modelling. Human Factors, System reliability Engineering. Requirements and Specification: The requirement Engineering Process, The Software requirement document, Validation of Evolution of requirements, Viewpoint – oriented & method based analysis, system contexts, Social 7 organizational factors. Data flow, Semantic, Objects, models, Requirement Specification, Non functional requirement.

**❖ Chapter-2 Software Prototyping 10 Hrs**

Prototyping in software process, Prototyping techniques, User interface prototyping. Software Design: Design Process, Design Strategies, Design Quality , System Structuring control models, Modular decomposition , Domain Specific architecture.

**Chapter-3 Object Oriented & function oriented design 10 Hrs**

Objects, object Classes and inheritance Object identification, An object oriented design example, Concurrent Objects, Data flow design Structural decomposition, Detailed Design, A Comparison of design Strategies. User interface design: Design Principles, User System interaction, Information Presentation, User Guidance, Interface Evaluation.

**❖ Chapter-4 Software Reliability and Reusability 10 Hrs**

Software reliability metrics , Software reliability Specification , Statistical testing, Reliability Growth modeling, Fault avoidance & tolerance, Exception handling & defensive programming , Software development with reuse, Software' development for reuse , Generator based reuse, Application System Portability.

**❖ Chapter-5 Software Verification and Validation 8Hrs**

The testing Process , Test Planning & Strategies, Black Box , Structural, interface testing, Program inspections , Mathematically based verification, Static analysis tools, Clean room software development. Management Issues: Project management, Quality management, Software cost estimation, Software maintenance.

**Reference Books:**

1. Ian Sommerville – Software Engineering, 9th Edition, Pearson Education Ltd, 2010.
2. Roger S. Pressman – Software Engineering, A Practitioner’s approach, 7th Edition, McGRAW-Hill.
3. Pankaj Jalote, “An integrated approach to Software Engineering”, 3rd Edition, Narosa Publishing House.

**5<sup>th</sup>Sem BCA**

**Paper: BCACsP5.8: DBMS MINI PROJECT**

**3Hrs /Week**

**Marks: 50**

Students are expected to develop a DBMS mini project. Students can carry out the project in a group /team. The entire project to be submitted by each group/team with some related entity information.

Project should contain module to insert, update and report generation.

**Scheme for Practical Examination**

1. Writing about project.	:	10 Marks
2. Execution and demonstration of Project	:	30 Marks
3. Project report	:	5 Marks
4. Viva Voce	:	5 Marks
<b>Total</b>	<b>:</b>	<b>50 Marks</b>



**5<sup>th</sup>Sem BCA**

**Paper: BCACsT5.9: PHP and MySQL**

**3 Hrs /Week**

**Total: 48 Hrs**

- ❖ **Chapter-1 Introduction to PHP** **8hrs**  
History, Advantages of PHP, HTML relationship, Interpreting vs. Compiling, Basic syntax of PHP, Writing and Running PHP scripts, variable types - Local and Global, Superglobal variable and their scope, Comments, Types of Data, Automatic type conversion, Forcing a type with type casting, Non-decimal number systems, Pre-set variables, Constants, Pre-set constants, Operators, unary operators, arithmetic operators, logical operators, conditional operators, conversion operators, Comparison operators, The Ternary Operator, The scope resolution operator. Control statements – sequence, Conditional statements, loops, jump statements.
- ❖ **Chapter-2 Arrays** **6hrs**  
Creating an array, Multidimensional arrays, Creating index based and Associative array, Accessing array, Element Looping with Index based array, Looping with associative array using each () and foreach(), Converting an array to individual variables, Array Library functions
- ❖ **Chapter-3 Functions and Strings** **8hrs**  
Functions overview, function prototypes, arguments, Working, Reading the current time, Recursive functions, mathematical conversion functions: Rounding, Randomization, Base conversion, Mathematical constants. Strings: Basic operations on strings-Reading from part of a string, Replacing parts of a string, Converting to and from ASCII, Finding a substring within a string, Trimming whitespace, Changing string case, Comparing strings, Parsing a string into variables, Regular expressions.
- ❖ **Chapter-4 OOPS Concept** **8 hrs**  
Classes, Defining a class and Objects, Constructor & Destructor, Method Overloading, Basic inheritance, Overriding functions, Variables, The 'this' variable, Access control modifiers-Public, Private, Protected, Final, Abstract, Iterating through object variables, Deleting objects, objects, Abstract class and Interfaces, Differencing object return values.
- ❖ **Chapter-5 Forms Processing** **6hrs**  
Designing a form, GET and POST, Handling data-register\_globals, Handling form, Form Validation:Client-side validation, Server-side validation. File Uploading – File Downloading through Form.Understanding file& directory. Working with directory.
- ❖ **Chapter-6 PHP & MySQL** **10hrs**  
Introduction to RDBMS, MySQL, PhpMyAdmin, PHP\_MySQL-DB functions, Connecting to a MySQL database, Performing basic database operation(DML) (Insert, Delete, Update, Select), Setting query parameter,

Executing query, Join (Cross joins, Inner joins, Outer Joins, Self joins.),Aggregate Functions(sum, avg, count).

❖ **Chapter-7 Introduction to Cookies and Sessions** **2 hrs**

Cookies, Sessions, Using cookies, Using sessions- Starting a session, ending a session, checking session data.

**Reference:**

1. Robert W.Sebesta: PHP Programming, Peason Education, 2008.
  2. Murach's PHP and MySQL: Training & Reference, Author: Joel Murach, Ray Harris
  3. PHP: The Complete Reference,StevenHolzner(Author).
  4. PHP Reference: Beginner to Intermediate PHP5, By Mario Lurig
1. **[www.w3schools.com](http://www.w3schools.com)**
  2. **[www.tuxradar.com/practicalphp](http://www.tuxradar.com/practicalphp)**.

**5<sup>th</sup>Sem BCA**

**Paper: BCACsP5.10: PHP LAB**

**3 Hrs /Week**

**50 Marks**

1. Write a PHP program to find the largest of three numbers using if\_else ladder.
2. Write a PHP program to check whether the given number is prime or not using for loop.
3. Write a PHP program to reverse a given number using while loop.
4. Write a PHP program to print the Fibonacci series using functions.
5. Write a PHP program to illustrate different string functions.
6. Write a PHP program to implement calculator using switch case.
7. Write a PHP program to find factorial of a number using for each loop.
8. Write a PHP program to sort the given array.
9. Write a PHP program to create and manage a database using SQL commands.
10. Write a PHP program to create and validate a email id.
11. Using PHP and SQL, create and validate a sample login form.
12. 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.
13. Using PHP and SQL, develop a program to accept employee information viz. Accession name, empno and basic from a web page and store the Information in a database and to calculate DA, HRA, Pf, TAX, Gross and net payand to display the details with proper headings.

**5<sup>th</sup>Sem BCA**  
**Paper: BCACs T5.11: DATA MINING**

**3 Hrs /Week**

**Total: 48 Hrs**

- ❖ **Chapter-1: Introduction to Data Mining** **15 Hrs**  
Basic Data Mining Task, DM versus Knowledge Discovery in Databases, Data Mining Issues, Data Mining Metrics, Social implementation of Data Mining, Architecture, of DM. Data Warehouse, Architecture of DW. Application of Data Mining & Data warehouse. OLAP and Data Cubes, Data processing - Need Data cleaning -Missing Values, Noisy Data. Data integration and Transformation, Data reduction, machine learning, pattern matching. Data mining software.
- ❖ **Chapter-2: Classification & Prediction** **10Hrs**  
Basic issues regarding classification and predication, Comparison of Classification and Prediction Methods. Classification by Decision Tree, Bayesian classification, classification by back propagation, Associative classification, Statistical-Based Algorithms, Prediction, Accuracy and Error Measures, Rule-Based Algorithms, Other Classification Methods. Classification software.
- ❖ **Chapter-3 Cluster analysis** **10Hrs**  
Cluster analysis – types of data – computing distances-types of cluster analysis methods - partitioned methods – hierarchical methods – density based methods – dealing with large databases – quality and validity of cluster analysis methods - cluster analysis software.
- ❖ **Chapter-4 Web data mining** **05Hrs**  
Introduction- web terminology and characteristics- locality and hierarchy in the web- web content mining-web usage mining- web structure mining – web mining software - Search engines: Search engines functionality- search engines architecture – ranking of web pages.
- ❖ **Chapter-5: Big Data** **8Hrs**  
Introduction to Big data-what, why, when. Types of Data. Characteristic of Five V's of Big Data (V5)- Veracity. Velocity, Variety, Veracity, Value. Tools used in Big data-NOSQL, MapReduce, Storage, Servers, Processing. Big data Techniques. Analysing Big Data- Descriptive Analytics, Predictive Analytics, Exploratory or Discovery Analytic, Prescriptive analytics. Applications of Big Data.

**Reference Book**

1. Data Mining: Concept and Techniques Han Elsevier ISBN : 978938031913
2. Margaret H. Dunham , S. Shridhar Data Mining- Introductory and advanced topics Pearson education
3. Tom Mitchell- machine learning McGraw hill 1997
4. Data Mining Techniques, Arun K Pujari , University Press
5. Bill Franks, Taming The Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics, Wiley, 2012.

**5<sup>th</sup>Sem BCA**  
**Paper: BCACsP5.12:SDLC LAB**  
**PRACTICAL**

**3Hrs /Week**

**50 Marks**

**Guidelines:**

- The aim of the SDLC lab is to acquire practical knowledge on the implementation of the application software project.
- Work 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 subjects studied or implementation of any innovative idea.
- The SDLC Lab includes the following details
  - a) Data collection/Field work with respect to the project to be carried out in 6 semester by the students
  - b) Data Analysis and planning
  - c) Data Design – system design and detailed design
  - d) ER Model
  - e) DFD

**University Exam will be conducted as follows.**

- Duration of Practical Examination is 3 hours
- Project SDLC demo will be conducted at the end of VI semester for 50 marks.
- Both the Examiners should conduct the examination during practical session.
- Should submit report of detailed Synopsis of the project.

**Scheme for Practical Examination**

1. Writing about project SDLC	:	10 Marks
2. Power Point Presentation of Project SDLC	:	30 Marks
3. Detailed synopsis of Project	:	5 Marks
4. Viva Voce	:	5Marks
<b>Total</b>	:	<b>50 Marks</b>

**6<sup>th</sup>SemBCA**

**Paper: BCACsT6.1 Programming Using Python**

**3 Hrs /Week**

**Total: 48 Hrs.**

- ❖ **Chapter 1: Python Programming basics:** **8Hrs**  
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:** **16 Hrs**  
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, DDL, DML, DTL commands.
- ❖ **Chapter 5: GUI Programming and Graphics** **8Hrs**  
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](http://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>

**6<sup>th</sup>Sem BCA**  
**Paper: BCACsP6.2: PYTHON LAB**  
**Practical**

**3Hrs/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  $\geq 80$   
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. 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  $t \geq 0$ .
10. 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.
11. 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 ( $s = \frac{v^2 - u^2}{2a}$ )
12. 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.



**6<sup>th</sup>Sem BCA**

**Paper: BCACsT6.3: MIS and ERP**

**3Hrs /Week**

**Total: 48Hrs**

❖ **Chapter 1: Introduction to MIS**

**7Hrs**

An overview of Management Information System: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Information requirements & Levels of Management, Simon's Model of decision-Making, Structured Vs Un-structured decisions, Formal vs. Informal systems. Developing Information Systems: Analysis & Design of Information Systems.

❖ **Chapter 2: Introduction to e-commerce**

**10 Hrs**

The scope of electronic commerce, Definition of electronic commerce, Electronic Commerce and the trade cycle, Electronic markets, Research and Support, Electronic Date, Interchange Internet commerce, Categories of e-commerce - B2B, B2C and Intra-Business., Portals, e-Governance, e-Learning and, Knowledge building

❖ **Chapter 3: Introduction To Accounting in Tally ERP.9 GST 13 Hrs**

Accounting Basics: Basic terms, meaning -Principles- Concepts – Conventions Objectives, functions and uses of Accounting, Advantages and limitations of accounting

About Tally ERP.9 GST, Versions, Special Features in Tally, Debit and Credit, 28 Pre-defined Accounting Groups-1) 15 Primary Group, 2) 13 Secondary groups.

**Primary Groups:** Branch/ Divisions, Capital Accounts, Current Assets, Current Liabilities, Direct Expenses, Direct Incomes, Fixed Assets, Indirect Expenses, Indirect Incomes, Investments, Loans(Liability), Misc. Expenses (ASSET), Purchase Account, Sales Account, Suspense Account.

**Secondary Groups:** Bank Accounts, Bank OD Account, Cash-in-Hand, Deposits (Asset), Duties and Taxes, Deposits(ASSET), Duties and Taxes, Loans and Advances (ASSET), Provisions, Reserves and Surplus, Secured Loans, Stock-in-Hand, Sundry Creditors, Sundry Debtors, Unsecured Loans.

Ledger, Single and Multiple Ledger, Stock Groups, Stock Items, Units of measure-Simple unit, Compound Unit, Godowns, Vouchers.

❖ **Chapter 4: Vouchers**

**10 Hrs**

**Accounting Vouchers:** Contra Vouchers, Payment Vouchers, Receipt Vouchers, Journal Vouchers, Sales Vouchers, Credit Note, Purchase Voucher, Debit Note, Reversing Journal, Memorandum Voucher.

**Inventory Vouchers:** Purchase Order, Purchase Quote, Sales Order, Sales Quote, Rejection Quote, Rejection In, Stock Journal, Delivery Note, Receipt Note, Physical stock voucher.

Invoice Entry, GSTR-1, GSTR-2, GSTR-3B, Payroll.

❖ **Chapter 5: Tally Reports**

**8 Hrs**

Balance Sheet, Stock Summary, Profit and Loss, Ratio Analysis, Trial Balance, Day Book, Account Books, Cash/Bank A/C Books, Sales Register, Purchase Register, Journal Register, Cash flow/Funds Flow, Payroll Reports.

**Reference Books:**

1. MIS by Hossein Bidgoli Nilanjan Chattopadhyay, Published by Cengage Learning.
2. James A. O'Brien, "Management Information Systems", Tata McGraw-Hill
3. Robert G. Murdick & Joel E. Ross & James R. Claggett, "Information Systems for Modern Management", PHI.
4. E-Commerce & Applications by Pandey
5. Learning Tally (with Introduction to Tally.ERP 9) by Ramesh Bangia

**6<sup>th</sup>Sem BCA**  
**Paper: BCACsP6.4: TALLYLAB**  
**PRACTICAL**

**3Hrs /Week**

**50 Marks**

1. Create, modify, and delete Company and Group Company
2. Create, modify, delete Accounting Groups and sub Groups
3. Create, modify, and delete Single Ledger and Multiple Ledgers and their Group Allocation
4. Create, modify, and delete voucher types
5. Take a simple problem for usage of different accounting vouchers
6. Prepare a final account for ABC Company using below given sample data.
  - a. Create a Company as “ABC Company” in Tally with inventory management.
  - b. Pass the following Entries:-
    - (i). XYZ started “ABC Company” by bringing Capital Rs.3,00,000/- Cash.
    - (ii) He deposited Rs.1,00,000/- cash at ICICI bank.
    - (iii) He paid electricity bill for Rs.1,200/- by cash.
    - (iv) He withdrawn Rs.10,000/- cash for his personal use.
    - (v) He purchased the following item from Computer Lab. Ltd. on credit with 4%Vat rate.
      - (a) Computer - 10 Nos. - @20000/- each
    - (vi) He sold the following item to Tumkur Traders in cash with 4% Vat rate.
      - (a) Computer - 5 Nos. - @27500/- each
    - (vii) He received Rs.6,000/- as commission from Rohit by cash.
    - (viii) He paid House Rent for Rs.5,000/- by cash.
    - (ix) He withdrawn Rs.25,000/- cash from ICICI Bank.
    - (x) He purchased furniture for Rs. 25,000/- by cash for office use.
  7. Backup and restore the company data.
3. Show the Trial Balance and Balance Sheet of “Sagar Industries Ltd.”
4. Show the Vat Computation report of the above company.
5. Show the Cash Book & Bank Book of the company.
6. Show the Day Book.
7. Backup and restore the company data.

**6<sup>th</sup>Sem BCA**

**Paper: BCACsT6.5: CRYPTOGRAPHY AND NETWORK SECURITY**

**3Hrs /Week**

**Total: 48Hrs**

❖ **Chapter-1: Introduction**

**10Hrs**

Security Goals, Cryptographic Attacks, Services and Mechanism, Model for Internetwork Security.

Cryptography: Notion of Plain Text, Encryption, Key, Cipher Text, Decryption and cryptanalysis; Public Key Encryption, digital Signatures and Authentication. Symmetric and Asymmetric Key Cryptography, Steganography.

❖ **Chapter-2: Security at the Application Layer**

**10Hrs**

Authentication, Kerberos, X.509, Directory Authentication Service, Pretty Good Privacy, S/MIME, Email.

❖ **Chapter-3: Security at the Transport Layer**

**10Hrs**

SSL and TLS: SSL Architecture, Four Protocols, SSL Message Formats, Transport Layer Security and Secure Electronic Transactions.

❖ **Chapter-4: Security at the Network Layer**

**10Hrs**

IP security-Overview of Architecture & Services, Authentication header, Encapsulating Security Pay Load combining Security Associations, security policy, Key Management.

❖ **Chapter-5: System Security**

**8 Hrs**

Intrusion detection – password management – Viruses and related Threats – Virus Counter measures – Firewall Design Principles – Trusted Systems.

**Reference Books:**

1. William Stallings: Network Security Essentials: Applications and Standards, 4<sup>th</sup> Edition, Pearson Education, 2012.
2. Michael E. Whitman and Herbert J. Mattord: Principles of Information Security, 2<sup>nd</sup> Edition, Thomson, Cengage Delmar Learning India Pvt., 2012.
- 3 Behrouz A. Forouzan, Debdeep Mukhopadhyay: Cryptography and Network Security, 2<sup>nd</sup> Edition, Special Indian Edition, Tata McGraw-Hill, 2011.

**6<sup>th</sup>Sem BCA**  
**Paper: BCACsP6.6: NETWORKING LAB**  
**PRACTICAL**

**3Hrs /Week**

**50 Marks**

1. Identification of different types of Network cables ,devices andinstall
2. Implementing the cross-wired cable and straight through cable using clamping tool.
3. ConfigurationofNetwork Devices: HUB, Switch and Routers.
4. Connect the computers in Local Area Network.
5. Establish Peer to Peer network connection using two systems using Switch in a LAN.
6. Design and Configure different classes of IP, Subnet Mask and Default Gateway in a System in LAN (TCP/IP Configuration).
7. Usage of basic network commands and Network configuration commands -Ipconfig, Ping, Tracer and Net stat utilities to debug the network issues.
8. Transfer files between systems in LAN, install Printer in a LAN and share the printer in a network.
9. Install and Configure Wireless NIC and transfer files between systems Wireless LAN.

**6<sup>th</sup>Sem BCA**

**Paper: BCACsT6.7: COMPUTER GRAPHICS**

**3Hrs /Week**

**Total: 48Hrs**

- ❖ **Chapter1: Graphics Systems and Output Primitives** **12Hrs**  
Application for CG, CG classification-Graphics software-CRT functioning-Factors affecting CRT- Raster and Random scan monitors-Shadow mask method, display processor with raster system- Raster co-ordinate system-color mapping- Instruction set and Raster system applications.  
Output Primitives: Line drawing methods-Direct, DDA and Bresenham's, line attributes, Circle drawing – Direct and midpoint circle drawing – ellipse drawing-Bresenham's ellipse algorithm-Area filling-scanline area filling and character attributes
- ❖ **Chapter 2: Two-dimensional Transformation** **8 Hrs**  
Basic Transformation, Translation, Rotation-Rotation with arbitrary point, Scaling-Scaling with fixed point, Reflection and Shear, matrix representation- homogeneous co-ordinates, Composite transformation-Raster methods for transformation.
- ❖ **Chapter 3: Windowing and Clipping** **6 Hrs**  
Window, viewport, viewing transformations, clipping process, point clipping, line clipping- Cohen Sutherland line clipping algorithm, midpoint subdivision algorithm, Area clipping, Sutherland and Hodgeman polygon clipping algorithm, text clipping, Window to view port transformation, Blanking.
- ❖ **Chapter: 3D-Graphics and Segments** **12Hrs**  
3D-coordinate system, 3D displays technique-Parallel Projection, Perspective Projection, Intensity Cueing. 3D Transformations- Translation, Scaling, Rotation, Reflection, Shearing, polygon surfaces, polygon tables, curves, Bezier curves, Octree, Fractals, Hidden line and surface removal algorithm-Depth buffer, Back-face and scan-line. Constructive Solid Geometry method- Union, Intersection, Difference. Sweep representation.  
Introduction to segments, functions for segmenting, display file, segment attributes, display file compilation.
- ❖ **Chapter 5: Graphical Input devices and Input Techniques** **10Hrs**  
Input Devices: Keyboard, Mouse, Joystick, Touch panels, Track ball, Light pen, Graphic tablets. Predefined Graphics functions.  
Positioning techniques, Grid, Constraints, Dynamic manipulation, Gravity field, Rubber band, Dragging, Selection technique, Menu, Pointing and selection by naming.

**References:**

1. Donald Gearn& M. Pauline Baker, Computer Graphics C, PHI 1990
2. Steven Harrington, Computer Graphics, McGH.
3. Newman &Sproull, Principles of Interactive Computer Graphics, McGH.
4. Yeshwant P. Kanetkar, Graphics under C, BPB publication.
5. J.D.Foley, A.V. Dam, S.K. Feiner and J.F.Hughes, Computer Graphics, Addison Wesley,1997
6. Cooley, The Essence of Computer Graphics, Pearson Education.
7. Sinha-Computer Graphics.

**6<sup>th</sup>Sem BCA**  
**Paper: BCACsP6.8: COMPUTER GRAPHICS LAB**  
**PRACTICAL**

**3Hrs /Week**

**50 Marks**

1. Write a program to draw a straight line using DDA technique.
2. Write a program to draw a straight line using Bresenham's technique.
3. Write a program to draw a circle using DDA technique.
4. Write a program to draw a Circle using Bresenham's technique.
5. Write a program to draw a triangle to perform translation
6. Write a program to draw a triangle to perform scaling
7. Write a program to draw a triangle to perform Rotation
8. Write a program to draw pie chart
9. Write a program to draw Histogram
10. Write a program to clip a triangle against a given window.
11. Write a program to animate a man walking with an umbrella.
12. Write a program to rotate an object from one end of the screen to the other end using the built-in line and circle functions.



**6<sup>th</sup>Sem BCA**

**Paper: BCACsT6.9: SYSTEM SOFTWARE**

**3 Hrs /Week**

**Total: 48 Hrs**

❖ **Chapter-1 Background**

**8 Hrs**

General Machine Structure, Evolution of the Components of a Programming System, Assembler, Compilers, Macros, Linkers, Loaders, Formal Systems. Machine Language, Assembly Language, difference between compiler and interpreter.

❖ **Chapter-2 Assemblers**

**10 Hrs**

Introduction to assembler, assembler directives, Forward reference table, Types of assemblers, Data structures and flowchart, assembler design one pass assembler, two pass assembler.

❖ **Chapter-3 Macro Language and Macro Processor**

**10 Hrs**

Macro instruction, Features of macro facility, Macro instruction arguments, conditional macro Expansion, macro calls within macros, macro instructions defining macros. Implementation, Statement of problem, implementation of a restricted facility, a two pass algorithm. A single pass algorithm, implementation of macro calls within macros. Implementation within an assembles.

❖ **Chapter-4 Loaders**

**10 Hrs**

Loader schemes, Compile & go, General loading Scheme, absolute loaders, Subroutine Languages, Relocating loaders, Direct linking loaders, other loading Schemes – Binders, linking loaders, Overlays, Dynamic binders. Design of absolute loader. Design of a direct linking loader Specification of problem, Specification of data structure, format of data bases algorithm.

❖ **Chapter-5 Compilers**

**10 Hrs**

General model of compiler. Simple Structure of Compiler, 7 Phases of Compilers: Lexical analysis, Syntax analysis, Semantic analysis, Intermediate (machine-independent) code generation, Intermediate code optimization, Target (machine-dependent) code generation, Target code optimization

**References:**

1. John J. Donowon , System Programming, TATA McGraw-Hil.
2. Beck: System Software, 3/e Pearson Education

Dhamdhare: System programming and Operating System TMH

**6<sup>th</sup>Sem BCA**  
**Paper: BCACsP6.10:SSPD LAB**  
**PRACTICAL**

**3Hrs /Week**

**50 Marks**

**Means of Communication:** Meaning and Definition, Process, Functions, Objectives ,Importance ,Essentials of good communication ,Communication barriers, 7C's of Communication.

**Types of Communication:** Oral Communication: Meaning, nature and scope, Principle of effective oral communication, Techniques of effective speech, Media of oral communication (Face-to-face conversation, Teleconferences ,Press Conference, Demonstration, Radio , Dictaphone, Meetings ,Rumor, Demonstration and Dramatization, Public address system ,Grapevine, Group Discussion, Oral report ,Closed circuit TV). The art of listening , Principles of good listening.

**Written Communication** Purpose of writing, Clarity in Writing, Principle of Effective writing, Writing Techniques, Electronic Writing Process. Business Letters & Reports: Need and functions of business letters ,Planning & layout of business letter, Kinds of business letters, Essentials of effective correspondence, Purpose, Kind and Objective of Reports, Writing Reports. Drafting of business letters: Enquiries and replies, Placing and fulfilling orders, Complaints and follow-up Sales letters, Circular letters Application for employment and resume

**Information Technology for Communication:** Word Processor ,Telex , Facsimile(Fax), E-mail, Voice mail ,Internet , Multimedia, Teleconferencing, Mobile Phone Conversation, Video Conferencing ,SMS, Telephone Answering Machine ,Advantages and limitations of these types. Topics Prescribed for workshop/skill lab Group Discussion, Mock Interview, Decision Making in a Group.Making Presentation slides and preparing reports

**Personality Development:**

**Personal planning and success attitude:** Prioritizing, creating the master plan, active positive visualization and positive attitude, How to build a success attitude, Spot analysis.

**Self motivation & communication:** Levels of motivation, power of irresistible enthusiasm, etiquettes and manners in a group, public speaking, oral and written communication, Body language, Importance of listening and responding.

**Leadership as a process :** co-ordination while working in a team, Types of Leader, Leadership traits & Team player , Management of conflict, Profiles of great and successful personalities, Role of career planning in personality development, How to face personal interviews and group discussions.

### GUIDELINES FOR SSPD LAB

- The SSPD work should be compulsorily carried out in the college only under the supervision of the concerned department staff.
- The aim of the SSPD lab is to equip the student with leadership qualities with acquired recent trends, information and general knowledge.
- The SSPD lab should also create to lead the group (Team, Task, Target time). It should also ensure the ethics and etiquettes.
- The student is expected to prepare his/her personal resume, Covering letter with attached passport size photograph, and also carry 3 sets of photo copies of all his/her marks card, achievements, awards etc.,
- He/she should groom for the said lab (mock interview).
- He/she should be tested for oral and written communication skills.
- He/she should be tested for ICT skills.
- **University Exam will be conducted as follows.**
  - ✓ His/Her personal bearing (Grooming) - 10 marks
  - ✓ For written skill (Current event topic) - 10 marks
  - ✓ Written communication (Letter drafting) - 10 marks
  - ✓ Interview skill (Oral communication) - 10 marks
  - ✓ Group discussion - 5 marks
  - ✓ Submission of Report - 5 marks

Total 50 marks

**Note:** Report (Executive file/folder) should contain his/her personal resume, Covering letter with attached passport size photograph, and also carry 3 sets of photo copies of all his/her marks card, achievements, awards, different types of letter formats, PPT of team work.

- Both the Examiners should conduct the Viva-Voce Examination during practical session.

**6<sup>th</sup>Sem BCA**

**Paper: BCACsT6.11: ARTIFICIAL INTELLEGEENCE**

**3Hrs /Week**

**Total: 48Hrs**

❖ **Chapter-1 Introduction to Artificial Intelligence**

**7Hrs**

Definition, AI Applications&Emerging technologies, Philosophy of AI, Goals of AI and Contribution to AI, AI representation, Properties of internal Representation Programming Without and With AI , What is AI Technique? , History of AI, Intelligence-Types of Intelligence, Difference between Human and Machine , Intelligence , Research areas of AI-Real Life Applications of Research Areas, Task Classification of AI , AI Issues

❖ **Chapter-2 Agents & Environment**

**4Hrs**

Agent and Environment, Agents Terminology Rationality, The Structure of Intelligent Agents the Nature of Environments, Properties of Environment

❖ **Chapter-3 Popular search algorithms**

**7Hrs**

Single Agent Path finding Problems, Search Terminology, Brute-Force Search Strategies –BFS,DFS

Informed (Heuristic) Search Strategies- A\* search, Greedy BFS, Local Search Algorithms-Hill climbing, Local beam search Simulated Annealing, TSP

❖ **Chapter-4 Fuzzy Logic Systems**

**5 Hrs**

Introduction to Fuzzy Logic, Fuzzy Logic Systems Architecture Example of a Fuzzy Logic System Fuzzy Logic Systems Architecture Example of a Fuzzy Logic System, Application Areas of Fuzzy Logic Advantages of FLSs Disadvantages of FLSs

❖ **Chaper-5 Natural Language processing**

**7 Hrs**

Natural language processing and understanding pragmatic, Components of NLP, Difficulties in NLU, NLP Terminology ,Steps in NLP, Implementation , Aspects of Syntactic Analysis

❖ **Chapter-6. Expert Systems**

**6Hrs**

Introduction to Expert Systems, Capabilities of Expert Systems, Components of Expert Systems, Knowledge Base, Inference Engine ,User Interface ,Expert Systems Limitations, Applications of Expert System, Expert System Technology, Development of Expert Systems: General Steps, Benefits of Expert Systems, case studies on expert systems.

❖ **Chapter-7 Robotics**

**5 Hrs**

Introduction to Robotics, Difference in Robot System and Other AI Program, Robot Architecture, Robot Locomotion, Components of a Robot, Computer Vision, Tasks of Computer Vision. Application Domains of Computer Vision, Applications of Robotics.

❖ **Chapter-8 Neural Networks**

**7 Hrs**

Introduction to neural networks and Artificial Neural Networks (ANNs), Basic Structure of ANNs Types of Artificial, Working of ANNs, Machine Learning in ANNs, Bayesian Networks (BN), Applications of Neural Networks

**Reference Books:**

1. E. Rich , K. Knight & S. B. Nair - Artificial Intelligence, 3/e, McGraw Hill.
2. Artificial Intelligence: A Modern Approach, Stuart Rusell, Peter Norving, Pearson Education  
2nd Edition.
3. Dan W. Patterson, Introduction to Artificial Intelligence and Expert Systems –Prentice Hal of  
India.
4. Cloksin&Mellish , Programming In Prolog, Narosa Publishing House.
5. Nillson Harcourt, Principles of Artificial Intelligence, Asia & Morgan.
6. N.P. Padhy “Artificial Intelligence and Intelligent Systems”, Oxford  
University Press-2015

**6<sup>th</sup>Sem BCA**  
**Paper: BCACsP6.12: PROJECT LAB**  
**PRACTICAL**

**3Hrs /Week**

**50 Marks**

**GUIDELINES FOR FINAL PROJECT WORK**

- 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 only 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 size paper and book binding with the following table of contents

- 1) Certificate
- 2) Acknowledgement
- 3) Synopsis
- 4) Contents
- 5) About the project
- 6) Analysis
- 7) Design
- 8) Coding
- 9) Testing
- 10) Reports/output
- 11) Conclusion
- 12) Bibliography