# Bachelor of Computer Applications

## Programme Code: BCA

## Duration – 3 Years Full Time

**Programme Structure
and
Curriculum & Scheme of Examination**

**2017**

# AMITY UNIVERSITY
## RAJASTHAN

# Programme Structure: BCA

**FIRST SEMESTER**

| CODE | COURSE | CATEGORY | L | T | P/FW | CREDIT UNITS |
|---|---|---|---|---|---|---|
| BCA101 | Mathematics – I | CC | 2 | 1 | - | 3 |
| BCA102 | Discrete Mathematical Structures with Applications to CS | CC | 2 | 1 | - | 3 |
| BCA103 | Computer Fundamentals & Programming in „C" Language | CC | 2 | 1 | - | 3 |
| BCA104 | Digital Electronics | CC | 2 | 1 | - | 3 |
| BCA105 | Data Communication & Networking | CC | 2 | 1 | - | 3 |
| BCA120 | Computer Fundamentals & Programming in „C" Language Lab | CC | - | - | 2 | 1 |
| **Domain Elective-I :** Choose any one from the following courses | | | | | | |
| BCA130 | Cyber Security | DE | 2 | 1 | - | 3 |
| BCA131 | Principles of Management | DE | | | | |
| **OPEN ELECTIVE** | | | | | | |
| | OPEN ELECTIVE | OE | 2 | 1 | - | 3 |
| **VALUE ADDED COURSES** | | | | | | |
| BCS 101 | English | VA | 1 | - | - | 1 |
| BSS 101 | Behavioural Science - I | VA | 1 | - | - | 1 |
| FLF 101 FLG 101 FLS 101 FLC 101 | Foreign Language - I French German Spanish Chinese | VA | 2 | - | - | 2 |
| | **TOTAL** | | | | | **26** |

**SECOND SEMESTER**

| CODE | COURSE | CATEGORY | L | T | P/FW | CREDIT UNITS |
|---|---|---|---|---|---|---|
| BCA201 | Mathematics - II | CC | 2 | 1 | - | 3 |
| BCA202 | Data & File Structures using C | CC | 2 | 1 | - | 3 |
| BCA203 | Computer Architecture & Assembly Language | CC | 2 | 1 | - | 3 |
| BCA204 | Systems Analysis & Design | CC | 2 | 1 | - | 3 |
| BCA220 | Data & File Structures using C Lab | CC | - | - | 2 | 1 |
| **Domain Elective-II :** Choose any one from the following courses | | | | | | |
| BCA230 | Networking for Home & Small Business | DE | 2 | 1 | - | 3 |
| BCA231 | Internet Fundamentals | DE | | | | |
| BCA232 | Production & Operations Management | DE | | | | |
| **OPEN ELECTIVE** | | | | | | |
| | OPEN ELECTIVE-II | OE | 2 | 1 | - | 3 |
| BCS 201 | English | VA | 1 | - | - | 1 |
| BSS 201 | Behavioural Science - II | VA | 1 | | | 1 |
| FLF 201 FLG 201 FLS 201 FLC 201 | Foreign Language - II French German Spanish Chinese | VA | 2 | - | - | 2 |
| | **TOTAL** | | | | | **23** |

**SUMMER PROJECT – I**

THIRD SEMESTER

| CODE | COURSE | CATEGORY | L | T | P/FW | CREDIT UNITS |
|------|--------|----------|---|---|------|--------------|
| BCA301 | Computer Oriented Statistical & Optimization Methods | CC | 2 | 1 | - | 3 |
| BCA302 | Object Oriented Programming Concepts Using C++ | CC | 2 | 1 | - | 3 |
| BCA303 | Database Management Systems | CC | 2 | 1 | - | 3 |
| BCA360 | Summer Project – I (Evaluation) | CC | - | - | - | 6 |
| BCA320 | Object Oriented Programming Concepts Using C++ Lab | CC | - | - | 2 | 1 |
| BCA321 | Database Management Systems Lab | CC | - | - | 2 | 1 |
| **Domain Elective-III :** Choose any one from the following courses | | | | | | |
| BCA330 | Working at a Small-to-Medium Business or ISPs | DE | 2 | 1 | - | 3 |
| BCA331 | Web Designing | | | | | |
| BCA332 | Accounting & Financial Management | DE | | | | |
| BCA333 | Advance Technologies in Computer Science | DE | | | | |
| BCA334 | Marketing Management | DE | | | | |
| | **OPEN ELECTIVE-III** | OE | 2 | 1 | - | 3 |
| EVS 001 | Environmental Studies | VA | 4 | - | - | 4 |
| BCS 301 | Communication Skills - I | VA | 1 | - | - | 1 |
| BSS 301 | Behavioral Science - III | VA | 1 | - | - | 1 |
| FLF 301 FLG 301 FLS 301 FLC 301 | Foreign Language - III French German Spanish Chinese | VA | 2 | - | - | 2 |
| | **TOTAL** | | | | | **31** |

FOURTH SEMESTER

| CODE | COURSE | CATEGORY | L | T | P/FW | CREDIT UNITS |
|------|--------|----------|---|---|------|--------------|
| BCA401 | Computer Oriented Numerical Methods | CC | 2 | 1 | - | 3 |
| BCA402 | Software Engineering | CC | 2 | 1 | - | 3 |
| BCA403 | Computer Graphics | CC | 2 | 1 | - | 3 |
| BCA404 | Design & Analysis of Algorithms | CC | 2 | 1 | - | 3 |
| BCA405 | Operating Systems | CC | 2 | 1 | - | 3 |
| BCA420 | Computer Graphics Lab | CC | - | - | 2 | 1 |
| **Domain Elective-IV :** Choose any one from the following courses | | | | | | |
| BCA430 | Introducing Routing & Switching in the Enterprise | DE | 2 | 1 | - | 3 |
| BCA431 | Introduction to Open Source Technologies (PHP, MySql) | DE | | | | |
| BCA432 | Programming in Visual Basic | DE | | | | |
| BCA421 | Introducing Routing & Switching in the Enterprise Lab | DE | - | - | 2 | 1 |
| BCA422 | Introduction to Open Source Technologies (PHP, MySql) Lab | DE | | | | |
| BCA423 | Programming in Visual Basic Lab | DE | | | | |
| **OPEN ELECTIVE-IV** | | | | | | |
| BCS 401 | Communication Skills - II | VA | 1 | - | - | 1 |
| BSS 401 | Behavioural Science - IV | VA | 1 | - | - | 1 |
| FLF 401 FLG 401 FLS 401 FLC 401 | Foreign Language - IV French German Spanish Chinese | VA | 2 | - | - | 2 |
| | **TOTAL** | | | | | **24** |

**SUMMER PROJECT – II**

FIFTH SEMESTER

| CODE | COURSE | CATEGORY | L | T | P/FW | CREDIT UNITS |
|---|---|---|---|---|---|---|
| BCA501 | Java Programming | CC | 2 | 1 | - | 3 |
| BCA502 | Systems Software | CC | 2 | 1 | - | 3 |
| BCA503 | UNIX Operating System & Shell Programming | CC | 2 | 1 | - | 3 |
| BCA560 | Summer Project – II (Evaluation) | CC | - | - | - | 6 |
| BCA520 | Java Programming Lab | CC | - | - | 2 | 1 |
| BCA521 | UNIX Operating System & Shell Programming Lab | CC | - | - | 2 | 1 |
| **Domain Elective-V :** Choose any one from the following courses | | | | | | |
| BCA530 | Designing & Supporting Computer Network | DE | 2 | 1 | - | 3 |
| BCA531 | Web Programming | DE | | | | |
| BCA532 | Data Warehousing  & Data Mining | DE | | | | |
| BCA522 | Designing & Supporting Computer Network Lab | DE | - | - | 2 | 1 |
| BCA523 | Web Programming Lab | DE | | | | |
| BCA524 | Data warehousing  & Data Mining Lab | DE | | | | |
| **OPEN ELECTIVE** | | | | | | |
| | OPEN ELECTIVE-III | OE | 2 | 1 | - | 3 |
| BCS 501 | Communication Skills - III | VA | 1 | - | - | 1 |
| BSS 501 | Behavioural Science - V | VA | 1 | - | - | 1 |
| FLF 501<br>FLG 501<br>FLS 501<br>FLC 501 | Foreign Language - V<br>French<br>German<br>Spanish<br>Chinese | VA | 2 | - | - | 2 |
| | **TOTAL** | | | | | **28** |

**SIXTH SEMESTER**

| CODE | COURSE | CATEGORY | L | T | P/FW | CREDIT UNITS |
|---|---|---|---|---|---|---|
| BCA601 | Multimedia & its Applications | CC | 3 | 1 | - | 4 |
| BCA660 | Project work/Dissertation | CC | - | - | - | 9 |
| BCA620 | Multimedia & its Applications lab | CC | - | 1 | 2 | 1 |
| **Domain Elective-VI :** Choose any one from the following courses | | | | | | |
| BCA630 | Network Security | DE | 2 | 1 | - | 3 |
| BCA631 | Web Technologies | DE | | | | |
| BCA632 | Cloud Computing | DE | | | | |
| BCA633 | Mobile Computing | DE | | | | |
| BCA634 | Artificial Intelligence | DE | | | | |
| **OPEN ELECTIVE** | | | | | | |
| | OPEN ELECTIVE | OE | 2 | 1 | - | 3 |
| | **TOTAL** | | | | | **20** |

# MATHEMATICS – I

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA101 | 2 | 1 | 0 | 3 |

**Course Objective:**
The objective of this course is to provide an introduction to the fundamentals and concepts of basic mathematics covering sets, functions, differentiation, integration, differential equations, vectors and matrices. This course aims to assist the students to develop confidence in handling mathematical concepts and techniques and to understand the principles and uses of differential and integral calculus.
 Course Contents:

**Module I: Sets**
Sets and subsets, finite and infinite sets. Algebra of sets: Union, Intersection, complementation, Demorgan laws, Common applications of algebra of sets.
Functions: Interval and sub-intervals. Definition of function and examples, polynomial, rational, exponential, logarithmic and trigonometric functions. Graph of some simple functions like polynomial (upto $3^{rd}$deg), rational, trigonometric functions, modulus, function, step functions, rational functions, composite functions, Limit of a function.

**Module II: Differentiation**
Differentiation of function, Derivative of some common functions, polynomial, rational, exponential, logarithmic and trigonometric functions.
Successive differentiation, Leibnitz theorem.

**Module III: Integration**
Integration as inverse process of differentiation, integration of simple functions, method of change of variable and substitution for integrals, definite integrals, simple problems of line integral.

**Module IV: Differential equations**
Differential equations of first order, Differential equations of second order with constant coefficients

**Module V: Vectors**
Vector, Vector Algebra: addition, subtraction, Scalar Multiplication. Magnitude, Vector multiplication, Simple application of Vectors.
Matrices: Matrix, Submatrix, types of matrices, such as symmetric, square, diagonal matrices, singular and nonsingular matrices. Addition, Subtraction, multiplication of matrices, Rank of matrix, Matrix equation, Solution by Cramer"s rule and Gauss elimination method.

**Examination Scheme:**

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

**Text & References:**

*Text:*
Engineering Mathematics, E. Kreyig

*References:*
Higher Engineering Mathematics, B. S. Grewal
Differential Calculus, Shanti Narayan

# DISCRETE MATHEMATICAL STRUCTURES WITH APPLICATIONS TO CS

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA102 | 2 | 1 | 0 | 3 |

**Course Objective:**

This course is aimed to solve standard topical text book-level problems by analytical means. Apply multiple concepts in the solution of a more sophisticated problem, which may be derived from a scientific application or from basic application. Model a topical problem from math, solve the problem, and report the results in the original problem context.

**Module I: Set Theory**
Sets, Types of Sets, Basic Operations on Sets, Venn diagram, Cartesian product of two sets, Distributive law, De Morgan"s Law

**Module II: Mathematical Logic and circuits**
Basic Concepts, Propositions or Statements, Truth Table, Connectives and Compound Propositions, Implication, Bi-conditional of Connectives, Converse, Inverse and Contra positive of an Implication, Tautology, Logical Equivalence, Switching Circuits

**Module III: Modern Algebra**
Binary Operations, Properties of Binary Operations, Semi group, Monoid, Groups, Finite and Infinite Groups, Algebra of Groups, Subgroups and other Groups.

**Module IV: Graph Theory**
Graph, Multi Graph, Complete Graph, Bi Graph, Degree, Degree Sequence, Matrices of graphs,  tree, spanning trees

**Module V: Data Analysis**
Data and Statistical Data, Frequency Distribution, Graphical Representation, Measure of the Central Tendency, Measures of Dispersion (Mean Deviation and Standard Deviation)

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| **Weightage (%)** | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- Elements of Discrete Mathematics: C.L. Liu
- Graph Theory: Wilson
- S.C Gupta & V.K. Kapoor, Fundamentals of Mathematical Statistics.

*References:*
- Discrete Mathematics: Harikishan&ShivrajPundir
- Discrete Mathematics: J.K. Sharma

# COMPUTER FUNDAMENTALS & PROGRAMMING IN „C" LANGUAGE

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA103 | 2 | 1 | - | 3 |

## Course Objective:
The primary objective of this course is to understand all the components of C, including the C language, the C Preprocessor, and the C Standard Library. An understanding of some advanced practical issues, including memory management, testing and debugging, complex declarations and expression evaluation, building and using libraries, and evaluating tradeoffs, such as size vs. speed and speed vs. complexity. The ability to write C code and create and manipulate linked lists.

## Course Contents:

**Module I: Introduction to Computer Fundamentals**
Basic Computer Organization, Computer Hardware Components, Disk, Primary and Secondary Memory, Keyboard, Mouse, Printer, Monitor, CD etc. Computer Software: Introduction to Application software, System Software, Compilers, Interpreters etc. Basic Operating System Concepts, Functional knowledge of MSDOS and WINDOWS. Number System-Binary, Hexadecimal, Octal, and Decimal.Conversion from one number system to another. Computer Codes - ASCII

**Module II: Introduction to 'C' Language**
Character set, Variables Identifiers, Data type, Arithmetic operation, Constant, operators, Expression, Assignments, basic input/output statements, Simple 'C. Programs.
Decision making in program, Relational Logical operators, if statements, if -else, nested if-else statements, Switch, case loop, Do-While, While, for loop and nesting of loop.

**Module III: Arrays and Functions**
One Dimensional Arrays, Arrays Manipulation, Sorting, Searching, Problems solving Top down Approach, Modular Programming and functions, Passing Arguments, call by value and call by references, Recursive function, .Recursion,

**Module IV: Pointers**
Pointers: Declaration, Pointer assignments, initialization, Pointers and Dynamic Memory Allocation , Discuss Array of Pointers .

**Module V: Structure and Union**
Structure definition, Declaration, structure Assignments, Arrays in structure, Structure Arrays, Pointer Structure, Nested Structure, Arrays and Arrays of Structure, Union and File Handling

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:
*Text:*
- Problem Solving through C language, E. Balagurusamy, TMH publication.
- Peter Nortons, "Introduction to Computers", TMH

*References:*
- Let us C, YashwantKanetkar, BPB Publication.
- P.K. Sinha, "Computer Fundamentals",  BPB Publications
- V. Rajaraman, "Computer Fundamentals", Prentice Hall
- Dromey. G, "How to Solve it by Computer, Prentice Hall
- Peter Nortons, "DOS Guide" , Prentice Hall
- Gottfried, "Programming in C", Schaum, Tata McGraw Hill
- Y. Kanetkar, "Let us C", BPB Publications
- Y. Kanetkar, "Understanding Pointers" , BPB Publications
- Schidlt, "The Complete Reference of C", Tata McGraw Hill

# DIGITAL ELECTRONICS

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA104 | 2 | 1 | 0 | 3 |

## Course Objective:

An entry level course in digital electronics covering number systems, binary mathematics, digital codes, logic gates, Boolean algebra, Karnaugh maps, and combinational logic. Emphasis will be on circuit logic analysis and design of digital circuits. The student will explain the operation of digital logic gates and use Boolean algebra and Karnaugh mapping to express logic operations and minimize logic circuits in design. The student will construct, analyze combinational logic circuits & sequential circuits; create a truth table for standard digital logic gates; and add, subtract, multiply and divide using the binary numbering system. Student will also be able to understand about digital to analog conversion and vice versa.

## Course Contents:

**Module I: Number System**
Decimal, Binary, Octal, Hexadecimal Number Systems and Conversion of the bases.
**Introduction to logic systems**
Positive and negative logic, Logic functions - NOT, AND, OR, NOR, EX-OR, EX NOR
Truth tables Boolean algebra, De Morgan's theorems Standard forms for Logical Expressions - Sum of Products, Product of Sums Specification of Logical functions in terms of Minterms and Maxterms, Karnaugh Maps, Simplification of Logical functions, Introduction of "don't care" states.

**Module II: Combinational Building Blocks**
Multiplexers, Decoders, Encoders
**Arithmetic circuits**
Half Adders and Full Adders, Half Subtractor and Full Subtractor, Representation of negative numbers, revisited

**Module III: Flip-flops**
The RS latch, the clocked RS flip-flop, JK Flip Flop,the Master-Slave JK flip-flop, Delay and Toggle flip-flops
**Flip-flops in counter circuits**
Asynchronous (ripple) Counters (UP/DOWN), Synchronous Counter design (UP/DOWN), Non Sequential Counting

**Module IV: Shift Registers**
Shift registers in general, Ring Counters, Johnson Counter
**Introduction to Memory**
Primary: RAM, Static RAM, Dynamic RAM, ROM, PROM, EAPROM, Secondary: Floppy Disk, Hard Disk, CDROM

**Module V: DACs and ADCs**
Binary weighted resistor DAC, Resolution, linearity and settling time of DACs, Successive approximation ADC

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- R.P Jain, Mordern Digital Electronics

*References:*
- Malvino& Leach, Digital Electronics
- Floyd, Digital Fundamentals
- M.M Mano, Digital Logic and Computer Design
- Gothman ,Digital Electronics

# DATA COMMUNICATION & NETWORKING

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA105 | 2 | 1 | 0 | 3 |

## Course Objective:

The objective of the course is to provide introductory concepts in Communications such as Signaling, Encoding, Modulation, Error Detection & Correction.

The course is also aimed at providing basic understanding of Computer networks starting with OSI Reference Model, Protocols at different layers with special emphasis on IP, TCP & UDP and Routing algorithms.

## Course Contents:

**Module I**

Introduction to Data Communication, Networks-protocols, advantages, disadvantages & applications, Line Configuration, topology, Transmission mode, Classification of networks.

Parallel & Serial Transmissions, Analog & Digital Signals, Periodic & Aperiodic Signals, Modulation---Amplitude Modulation, Frequency Modulation, Phase Modulation, Pulse Amplitude Modulation, Pulse Code Modulation, Sampling.

**Module II**

Amplitude Shift Keying, Frequency Shift Keying, Phase Shift Keying, Bit/ Baud Comparison, DTE-DCE Interface, 56 K Modem, Cable Modem.

OSI Model, Transmission Media-Twisted Pair Cable, Coaxial Cable, Fiber-Optics Cable, Radio frequency Allocation, Terrestrial Microwave, Infrared rays, Satellite Communication, Cellular Telephony. Introduction to ISDN.

**Module III**

Framing, Line Discipline, Types of Errors, Error Detection & Correction (VRC, LRC, CRC, Checksum, Hamming Code), Flow Control (Stop-and-wait & Sliding Window), Error Control (Stop & Wait ARQ, Sliding Window ARQ using Go-back n method and Selective-Reject).

CSMA/CD, Project 802, IEEE Standards-802.3, Token Bus (802.4), Token Ring (802.5), Introduction to Bridges.

**Module IV**

Internal Organization of Network Layer, Routing Algorithms-Shortest Path Routing, Flooding, Distance Vector Routing, Link State Routing, General Principles of Congestion, Congestion Prevention Policies. Duties of Transport Layer, Connection Establishment & Connection Termination.

**Module V**

Introduction to TCP/IP, Data Link Layer in Internet-SLIP & PPP, Network Layer in Internet-IP protocol, IP addressing, Subnetting& Internet Control Protocols, Transport Layer in Internet-TCP & UDP.

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

- Behrouz ., Forouzan., "Data Communication and Networking", TMH
- W. Stallings, "Data and Computer Communication" PHI
- A.S. Tanenbaum, "Computer Networks" , PHI
- Kennedy, "Electronics Communication System", TMH

# Computer Fundamentals & Programming in „C" Language LAB

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA120 | 0 | 0 | 2 | 1 |

1. Write a program to find the area and perimeter of (I) square (ii) rectangle.
2. Write a Program to find the sum of first n natural numbers.
3. Write a program to calculate the average of n numbers.
4. Write a program to check whether the number is even or odd.
5. Write a program to find largest of three numbers.
6. Write a program to swap the values of two given variables.
7. Write a program to find the square of a given number.
8. Write a program to calculate the roots of a quadratic equation.
9. Write a program to compute the sum of squares of n natural numbers.
10. Write a program to reverse a given number and also calculate the number of digits in the number.
11. Write a program to calculate the sum of digits of a given number.
12. Write a program to calculate the factorial of a given positive number.
13. Write a program to generate fibonaaci series upto n terms.
14. Write a program to find the GCD and LCM of two given positive numbers.
15. Write a program to print first n prime numbers.
16. Write a program to print 1 if input character is capital, 2 if input character is a lowercase alphabet, 3 if input character is a digit and 4 if some other special character.
17. Write a C program to check whether a number is an Armstrong number.
18. Write a C program to find the power of a number.
19. Write a C program to find the sum of n terms of the series: $n-n*2/2!+n*3/3!-n*4/4!+\ldots\ldots$
20. Write a C program to find the maximum/minimum number in a given array.
21. Write a C program to search a number in an array using linear search.
22. Write a C program to sort a given array using Bubble sort.
23. Write a C program to concatenate two one-dimensional arrays.
24. Write a C program to add, subtract and multiply two m by n matrices.
25. Write a C program to detect the occurrence of a character in a given string.
26. Write a C program to count the number of characters in a given string with and without using strlen () function,
27. Write a C program to copy the contents of one string to another with and without using strcpy () function.
28. Write a C program to determine whether the entered character string is palindrome or not.
29. Write a C program to enter the marks, address of several students and prepare the mark sheet of each student. Use structures.
30. Write a C program to calculate net salary / printing of salary statement of an employee. Use Structures.
31. Write a C program to calculate the factorial of a number using recursion.
32. Write a C program to generate a fibonacci series using recursion.

## Examination Scheme:

| IA | | | | EE | |
|---|---|---|---|---|---|
| A | PR | LR | V | PR | V |
| 5 | 10 | 10 | 5 | 35 | 35 |

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# CYBER SECURITY

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA130 | 2 | 1 | 0 | 3 |

## Course Objective:

The goal of the Cyber Security course is to provide an awareness of cyber threats and vulnerabilities, risk factors present in the cyber world. It will provide the student with basic knowledge of cyber crime dynamics and is aware to the students desiring Security Systems

## Course Contents:

### Module I: Introduction to Cyber Security

Introduction to Cyber Security, Cyber Crime / Social Theories, Threats to security, Government requirements, Information Protection and Access Controls, Computer security efforts, Standards, Computer Security mandates and legislation, Privacy considerations, International security activity, Intrusion Detection , Malicious Software Use and Detection

### Module II: Information Technology Law

The Information Technology Legal Framework in India, Cyber Crime, Digital Evidence, Technological Standards under the Information Technology Law, Liability of companies under the Information Technology Act

### Module III: Network Security

Intrusion Detection & Prevention systems, Firewalls and Firewall Policy, Computer Security Log Management, Securing WiMAX Wireless Communications

### Module IV: Information security

Fundamentals, Employee responsibilities, information classification, Information handling, Tools of information security, Information processing, secure program, administration.

### Module V: Information Technology Act Compliance

IT Act compliance for e-Commerce Sector, Education Sector, Healthcare Sector, Hospitality Sector, Outsourcing Sector, Retail Sector

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 10 | 15 | 5 | 70 |

## Text & References:

### Text Book:
- ☗ Rick Lehtinen and G.T. Gangemi, Computer Security Basics, 2$^{nd}$ ed. (2006),  O'Reilly Media Inc.

### Reference Book:
- ☗ McClure, Stuart & Scambray, Joel, Hacking Exposed 5$^{th}$ ed. et al (2005),, McGraw-Hill Osborne Media.
- ☗ Ortmeier, P. J., Security Management: An Introduction, 2$^{nd}$ ed. (2005), Prentice Hall.

# PRINCIPLES OF MANAGEMENT

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA131 | 2 | 1 | 0 | 3 |

## Course Objective:

The objective of this course is to expose to the theories of management, organizational theory, and the practice of management in contemporary organizations from a conceptual, analytical, and pragmatic perspective. It covers the basic functions of management: planning, organizing, leading, and controlling. Relevance of Computer Applications in Different Functional areas of Management, Decisions Making Process in the principles and role of leadership, communication, and motivation in the management teams.

## Course Contents:

**Module I: Conceptual Framework of Management**
History and Foundations of Management, Components of Management, Distinguish between components like Features of Management, Functions of Management, Nature of Management, Levels of Management, Understand the interplay between management and administration, Appreciate the concept of management as a profession.

**Module II: Evolution and Foundation of Management Theories**
Introduction to various theories of management, The Classical Organization theory, Neoclassical Approach of theory, Implications of Hawthorne experiments, Systems Approach of Organization, Systems and Modern Organisational theories.

**Module III: Study of Management Processes**
Basically Planning, Organizing, Directing, Staffing, Communicating, Controlling, Coordinating, To understand the planning process, Its Objectives and Characteristics, Policy and its meaning, Procedure Defined.

**Module IV: Types of Organisational Structures and Designs**
Meaning and Definition of Organisation, Basic Elements / Steps/Features of an Organization, Characteristics of an Organisation ,Formal and Informal Organisation, Functions and Design of an Organisation, Types of Organisations

**Module V: Relevance of Computer Applications in Different Functional Areas of Management Viz**
Financial Management, Materials Management, Production Management, Human Resources Management and Marketing Management.
Study of different Managements Structures, their Characteristics, Decision Making Techniques, Goals and Motivation and overview of behaviour study

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- Management and Principles, Parag Diwan & L.N Agrawal.

*References:*
- Organisational Behaviour, Fred Luthans
- Principles and Practices of Management, L.M Prasad

# ENGLISH

| Course Code | L | T | P | Credit |
|:---:|:---:|:---:|:---:|:---:|
| BCS101 | 1 | 0 | 0 | 1 |

## Course Objective:

The course is intended to give a foundation of English Language. The literary texts are indented to help students to inculcate creative & aesthetic sensitivity and critical faculty through comprehension, appreciation and analysis of the prescribed literary texts. It will also help them to respond form different perspectives.

## Course Contents:

**Module I: Vocabulary**
Use of Dictionary
Use of Words: Diminutives, Homonyms & Homophones

**Module II: Essentials of Grammar - I**
Articles
Parts of Speech
Tenses

**Module III: Essentials of Grammar - II**
Sentence Structure
Subject -Verb agreement
Punctuation

**Module IV: Communication**
The process and importance
Principles & benefits of Effective Communication

**Module V: Spoken English Communication**
Speech Drills
Pronunciation and accent
Stress and Intonation

**Module VI: Communication Skills-I**
Developing listening skills
Developing speaking skills

**Module VII: Communication Skills-II**
Developing Reading Skills
Developing writing Skills

**Module VIII: Written English communication**
Progression of Thought/ideas
Structure of Paragraph
Structure of Essays

**Module IX: Short Stories**
Of Studies, by Francis Bacon
Dream Children, by Charles Lamb
The Necklace, by Guy de Maupassant
A Shadow, by R.K.Narayan
Glory at Twilight, Bhabani Bhattacharya

**Module X: Poems**

| | |
|---|---|
| All the Worlds a Stage | Shakespeare |
| To Autumn | Keats |
| O! Captain, My Captain | Walt Whitman |
| Where the Mind is Without Fear | Rabindranath Tagore |
| Psalm of Life | H.W. Longfellow |

**Examination Scheme:**

| Components | A | CT | HA | EE |
|---|---|---|---|---|
| Weightage (%) | 05 | 15 | 10 | 70 |

**Text & References:**

- MadhulikaJha, Echoes, Orient Long Man
- Ramon &Prakash, Business Communication, Oxford.
- Sydney Greenbaum Oxford English Grammar, Oxford.
- Successful Communications, MalraTreece (Allyn and Bacon)
- Effective Technical Communication, M. Ashraf Rizvi.

**\* 30 hrsProgramme to be continued for Full year**

# BEHAVIOURAL SCIENCE - I

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BSS101 | 1 | 0 | 0 | 1 |

## Course Objective:

This course aims at imparting an understanding of:
Self and the process of self exploration
Learning strategies for development of a healthy self esteem
Importance of attitudes and its effect on personality
Building emotional competence

## Course Contents:

**Module I: Self: Core Competency**
Understanding of Self
Components of Self – Self identity
Self concept
Self confidence
Self image

**Module II: Techniques of Self Awareness**
Exploration through Johari Window
Mapping the key characteristics of self
Framing a charter for self
Stages – self awareness, self acceptance and self realization

**Module III: Self Esteem & Effectiveness**
Meaning & Importance
Components of self esteem
High and low self esteem
Measuring your self esteem

**Module IV: Building PositiveAttitude**
Meaning and Nature of Attitude
Components and Types of Attitudes
Relevance and Importance of Attitudes

**Module V: Building Emotional Competence**
Emotional Intelligence – Meaning, Components, Importance and Relevance
Positive and Negative Emotions
Healthy and Unhealthy expression of Emotions

**Module VI: End-of-Semester Appraisal**
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

## Examination Scheme:

| Components | SAP | A | Mid Term Test (CT) | VIVA | Journal for Success (JOS) |
|---|---|---|---|---|---|
| Weightage (%) | 20 | 05 | 20 | 30 | 25 |

## Text & References:

- Dressler, David and Cans, Donald: The Study of Human Interaction
- Lindzey, G. and Borgatta, E: Sociometric Measurement in the Handbook of Social Psychology, Addison – Welsley, US.
- J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company

# FRENCH - I

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLF101 | 2 | 0 | 0 | 2 |

## Course Objective:

To familiarize the students with the French language
- with the phonetic system
- with the syntax
- with the manners
- with the cultural aspects

## Course Contents:

**Module A:pp. 01 to 37: Unités 1, 2, Unité 3 Objectif 1,2**
Only grammar of Unité 3: objectif 3, 4 and 5

**Contenu lexical:Unité 1: Découvrir la langue française: (oral et écrit)**
> 1. se présenter, présenter quelqu"un, faire la connaissance
des autres, formules de politesse, rencontres
> 2. dire/interroger si on comprend
> 3. Nommer les choses

**Unité 2: Faire connaissance**
> 1. donner/demander des informations sur une personne,
premiers contacts, exprimer ses goûts et ses préférences
> 2. Parler de soi: parler du travail, de ses activités, de son pays, de sa ville.

**Unité 3:Organiser son temps**
> 1. dire la date et l"heure

**Contenu grammatical:**
1. organisation générale de la grammaire
2. article indéfini, défini, contracté
3. nom, adjectif, masculin, féminin, singulier et pluriel
4. négation avec « de », "moi aussi", "moi non plus"
5. interrogation: Inversion, est-ce que, qui, que, quoi, qu"est-
ce que, où, quand, comment, quel(s), quelle(s)
     Interro-négatif: réponses: oui, si, non
6. pronom tonique/disjoint- pour insister après une préposition
7. futurproche

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

- le livre à suivre: Campus: Tome 1

# GERMAN - I

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLG101 | 2 | 0 | 0 | 2 |

## Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

## Course Contents:

**Module I: Introduction**
Self introduction: heissen, kommen, wohnwn, lernen, arbeiten, trinken, etc.
All personal pronouns in relation to the verbs taught so far.
Greetings: Guten Morgen!, Guten Tag!, Guten Abend!, Gute Nacht!, Danke sehr!, Danke!, Vielen Dank!, (es tut mir Leid!),
Hallo, wie geht"s?:   Danke gut!,  sehr gut!, prima!, ausgezeichnet!,
                       Es geht!, nicht so gut!, so la la!, miserabel!

**Module II: Interviewspiel**
To assimilate the vocabulary learnt so far and to apply the words and phrases in short dialogues in an interview – game for self introduction.

**Module III: Phonetics**
Sound system of the language with special stress on Dipthongs

**Module IV: Countries, nationalities and their languages**
To make the students acquainted with the most widely used country names, their nationalitie and the language spoken in that country.

**Module V: Articles**
The definite and indefinite articles in masculine, feminine and neuter gender. All Vegetables, Fruits, Animals, Furniture, Eatables, modes of Transport

**Module VI: Professions**
To acquaint the students with professions in both the genders with the help of the verb "sein".

**Module VII: Pronouns**
Simple possessive pronouns, the use of my, your, etc.
The family members, family Tree with the help of the verb "to have"

**Module VIII: Colours**
All the color and color related vocabulary – colored, colorful, colorless, pale, light, dark, etc.

**Module IX: Numbers and calculations – verb "kosten"**
The counting, plural structures and simple calculation like addition, subtraction, multiplication and division to test the knowledge of numbers.
"Wie viel kostet das?"

**Module X: Revision list of Question pronouns**
W – Questions like who, what, where, when, which, how, how many, how much, etc.

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation

**Text & References:**

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al,  Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

# SPANISH – I

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLS101 | 2 | 0 | 0 | 2 |

## Course Objective:
To enable students acquire the relevance of the Spanish language in today"s global context, how to greet each other. How to present / introduce each other using basic verbs and vocabulary.

## Course Contents:

**Module I**
A brief history of Spain, Latin America, the language, the culture…and the relevance of Spanish language in today"s global context.
Introduction to alphabets

**Module II**
Introduction to „*Saludos*" (How to greet each other.How to present / introduce each other).
Goodbyes (despedidas)
The verb *llamarse*and  practice of it.

**Module III**
Concept of Gender and Number
Months of the years, days of the week, seasons. Introduction to numbers 1-100, Colors, Revision of numbers
and introduction to ordinal numbers.

**Module IV**
Introduction to *SER* and *ESTAR* (both of which mean To Be).Revision of „*Saludos*" and „*Llamarse*". Some adjectives, nationalities, professions, physical/geographical location, the fact that spanish adjectives have to agree with gender and number of their nouns. Exercises highlighting usage of *Ser* and *Estar*.

**Module V**
Time, demonstrative pronoun  (Este/esta, Aquel/aquella etc)

**Module VI**
Introduction to some key AR /ER/IR ending regular verbs.

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

- Español, En Directo I A
- Español Sin Fronteras

# CHINESE – I

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLC101 | 2 | 0 | 0 | 2 |

## Course Objective:

There are many dialects spoken in China, but the language which will help you through wherever you go is Mandarin, or Putonghua, as it is called in Chinese. The most widely spoken forms of Chinese are Mandarin, Cantonese, Gan, Hakka, Min, Wu and Xiang. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

## Course Contents:

**Module I**
Show pictures, dialogue and retell.
Getting to know each other. Practicing chart with Initials and Finals. (CHART – The Chinese Phonetic Alphabet Called "Hanyu Pinyin" in Mandarin Chinese.) Practicing of Tones as it is a tonal language.
Changes in 3rd tone and Neutral Tone.

**Module II**
Greetings
Let me Introduce
The modal particle "ne".
Use of Please „qing" – sit, have tea ………….. etc.
A brief self introduction – Ni haoma?Zaijian!
Use of "bu" negative.

**Module III**
Attributives showing possession
How is your Health? Thank you
Where are you from?
A few Professions like – Engineer, Businessman, Doctor, Teacher, Worker.
Are you busy with your work?
May I know your name?

**Module IV**
Use of "How many" – People in your family?
Use of "zhe" and "na".
Use of interrogative particle "shenme", "shui", "ma" and "nar".
How to make interrogative sentences ending with "ma".
Structural particle "de".
Use of "Nin" when and where to use and with whom.Use of guixing.
Use of verb "zuo" and how to make sentences with it.

**Module V**
Family structure and Relations.
Use of "you" – "mei you".
Measure words
Days and Weekdays.
Numbers.
Maps, different languages and Countries.

Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:
 **"Elementary Chinese Reader Part I" Lesson 1-10**

# MATHEMATICS – II

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA201 | 2 | 1 | 0 | 3 |

## Course Objective:

The Objective of this course is to expose the students to the fundamentals and the concepts of Mathematics including Real Number Systems, Limits and Continuity, Sequences of Real numbers, Infinite series and application of derivatives etc. This course is designed to understand the basic mathematical logic as a foundation of computer science and applications.

## Course Contents:

**Module I: Real Number System**
Natural number [Peano"s axiom- mathematical induction- well ordering principle], The Integers, The Rational field [Rational numbers and their main properties: Algebraic properties, field properties, ordered field] Archimedean property, Geometrical Representation, Countability of a set, The Real no. system as a complete ordered field , neighborhood, open sets, closed sets, limit points of sets.

**Module II: Limits and Continuity**
Limits, Continuity, Piecewise Continuous Functions – discontinuous functions, Algebra of Continuous function, Continuity of Composite functions, Continuity on (a, b), implying boundedness.

**Module III: Sequences**
Sequences of Real numbers, Bounded Sequence, Monotone Sequence, Limit of a sequence (Convergent Sequence), Limits Superior and Limits Inferior, Cauchy Sequence.

**Module IV: Infinite Series**
Infinite series, Convergence of series, Series of positive terms, Comparison tests, D" Alembents ratio test, Cauchy"s root test, Raabe"s test, Gaussian test.

**Module V: Application of Derivatives**
Rolle"s theorem, Mean value theorem: Langrange"s form, Cauchy"s form. Generalized Mean value theorem.
Maxima and minima application of maxima and minima
Taylor"s theorem, Indeterminate form: Taylor"s infinite series, Maclaurian"s series, Power Series Expension of some standard functions: $e^x$**,** sin x, cos x, Log (1+x), $(1+x)^n$ etc.,.

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- Shanti Narayan, Differential Calculus
- B. S. Grewal, Higher Engineering Mathematics

*References:*
B. S. Grewal, Higher Engineering Mathematics

# DATA & FILE STRUCTURES USING C

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA202 | 2 | 1 | - | 3 |

## Course Objective:

This course is an introduction to the use, design, and analysis of data structures in computer programs. The very commonly used data structures like arrays, stacks, queues, lists, trees, and graphs will be discussed in detail. Sorting and hashing are important topics in the study of algorithms. They are also closely related to the design of data structures. Several algorithms to implement these techniques are included in the syllabus.

## Course Contents:

### Module I: Basic concepts of data representation
Abstract data types: Fundamental and derived data types, Representation, Primitive Data Structures.

### Module II: Arrays
Representation of arrays single and multi dimensional arrays. Address calculation using column and rows major ordering. Various operations on arrays, Vector, Application of arrays: matrix multi multiplication, sparse polynomial and addition.

### Module III: Stacks and Queues
Representation of stacks and queues using arrays and linked list.Circular queues, priority queue and D-queue. Application of stacks: conversion from infix to postfix expression, Evaluation of postfix expression using stacks.

### Module IV: Linked List
Singly linked list; operations on list. Linked stacks and queue. Polynomial representations and manipulation using linked lists, doubly linked list, addition of two polynomial list.

### Module V: Trees
Binary trees traversal method: preorder, in-order, post-ordered traversal. Recursive and non-recursive algorithm for above mentioned Traversal methods. Representation of trees and its application: Binary tree representation of a tree, Binary search tree: height balanced (AVL) tree

### Module VI: Searching, sorting and complexity
Searching: Sequential and binary search, indexed search, Sorting: insertion, selection, bubble, quick, merge, heap sort.

### Module VII: Graphs
Graph representation: adjacency list, adjacency multicasts, adjacency lists. Traversal scheme: Depth first search, Breadth first search. Spanning tree: definition, minimal spanning tree algorithms.

Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

- T. Langsam, M.J Augenstein and A.M. Tanenbaum, "Data structure using C and C++ Second edition, 2000, Prentice Hall of India.
- R.Kruse, G.L. Tonodo and B. Leung," Data structures and program design in C", Second Edition, 1997, Pearson education.
- S. Chottopadhayay, D. Ghoshdastidar& M. Chottopadhayay. Data structures through language", First edition, 2001, BPB Publication.
- G.L. Heileman, Data structures, Algorithms and object oriented programming," First Edition 2002, Tata McGraw Hill.
- E. Horowitz, Sahni and D. Mehta," Fundamentals of data structures in C++,"200 Galgotia Publication

# COMPUTER ARCHITECTURE & ASSEMBLY LANGUAGE

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA203 | 2 | 1 | 0 | 3 |

## Course Objective:

The student will develop an understanding of the underlying operation of a modern digital computer, identify and understand the various "building blocks" from which a modern computer is constructed. The student will learn to develop simple assembly language programs and understand the underlying operations of more complex programs using Intel"s 8085 Microprocessor.

## Course Contents:

**Module I: General Computer Architecture**
Block Diagram of typical Computer, Memory Section, Input/Output Section, CPU, Registers, Arithmetic Unit, Instruction handling Areas, Stacks
**Micro operations:** Register Transfer, Bus and Memory Transfer, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations, Arithmetic Logic Shit Unit

**Module II: Basic Computer Organization and Design**
Instruction Codes, Operation code, Timing and Control, Instruction Cycle, Memory Reference Instructions, Input Output Instructions and Interrupts
**Control Memory:** Control Word, Microinstruction, Microprogramming, Control Memory, Hardwired

**Module III: Central Processing Unit**
General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, RISC, CISC
**Pipelining and Vector Processing:** Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, Vector Processing, Array Processors

**Module IV: Input Output Organization**
I/O Interface, Asynchronous Data Transfer, Modes of Transfer, Priority Interrupt, DMA, IOP, Serial Communication
**Memory Organization:** Associative Memory, Cache Memory, Virtual Memory

**Module V: Introduction to Microprocessor**
Machine Language, Assembly Language, Assembler, High Level Language, Compiler, Interpreter, Internal Architecture 8085.

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- Computer System Architecture, M.M. Mano, Pearson Education.

*References:*
- Computer Architecture and Organization, J.P Hayes, TNH.
- Lance A Leventhal Introduction to Microprocessors: Software, Hardware, Programming
- Hwang and Briggs Computer Architecture and Parallel Processing
- Hayes Computer Architecture and Organization
- TannenbaumStructured Computer Organization
- ZakyComputer Organization
- William Stallings Computer Organization and Architecture
- CarpinelliComputer Systems Organization and Architecture
- Hennesy& Patterson Computer Architecture

# SYSTEMS ANALYSIS & DESIGN

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA204 | 2 | 1 | 0 | 3 |

## Course Objective:

This course addresses both what is required of an Information System and how this can be achieved. Studying the practices, processes, activities and technologies involved in the development of an Information system provide an excellent insight to develop skills for employment & professional life. Students are involved in activities ranging from the front-end of requirements analysis and system design to the development of User Interfaces and testing & maintenance of software. The course equips the student to carve a niche in the growing portfolio of Information systems careers or go in for higher studies e.g. MCA, MBA & other Master"s level programmers.

## Course Contents:

**Module I: System Concepts and the Information Systems Environment**
What is System?, Important System Characteristic, Business Systems, Business, Information Systems, Categories of Information Systems, Transaction, Processing System, MIS, DSS, and Scope of Information system.
The Role of System Analyst: Overview of System Analysis and Design, Multifaceted role of System analyst: Analytical Skill, Technical Skills, and Interpersonal Skills.

**Module II: System Development Life Cycle**
The System Development Life Cycle, Structured Analysis Development Method, and Systems Prototype Method. System planning and Initial Investigation: System Planning: Information System Committee Method, User Group Committee Method, Initial Investigation, Feasibility Study: Operational, Technical and Economical Feasibility Cost Benefit Analysis: Data Analysis, Cost Benefit Analysis, The system proposal.

**Module III: Determining System Requirements**
Performing Requirements Determination, Traditional Method, Modern" Methods, and Radical Methods. The Tools of Structured Analysis: Process Modeling: DFD, Logical Modeling: Structured English, Decision Trees, and Data Modeling: ER Diagram

**Module IV: Process and Stages of System Design**
The process of design: logical design, physical design, Structured Design, Functional Decomposition, and Structured Walkthrough. Input/Output and Forms Design: Input design, output design, *forms* design, types of *forms,* layout considerations and *forms* control.

**Module V: File organization and Database Design**
File structure, file organization, -objectives of database, data structure, normalization, the role of database administrator. Automated Tools *for* Systems Development: CASE Tools

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

- P-analysis & Design of Information Systems James A. Senn
- Modern System Analysis & Design: Jeffery A. Hoffer, Joey F. George, Joseph S. Valacich
- Elements of System Analysis & Design: Elias Awad.

# DATA & FILE STRUCTURES USING „C‟ LAB

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA220 | - | - | 2 | 1 |

1. Write a program to search an element in a given array using linear search.
2. Write a program to search an element in a given array using binary search.
3. Write a program to sort the elements of an array using the following techniques: Bubble Sort, Selection Sort, and Insertion Sort. Compare the time taken by each sorting technique.
4. Write a program using the concept of iteration and recursion to sort the elements of an array using Quick Sort.
5. Write a C program to implement Heap sort.
6. Write a program to delete an element from the $k^{th}$ element of an array.
7. Write a program to insert an element at the $k^{th}$ element in an array.
8. Write a program to remove duplicates in an array.
9. Write a program to merge two sorted arrays.
10. Write a program to perform the following operations on two given matrices: Addition and Multiplication.
11. Write a program to implement a Stack, show overflow and underflow while performing push and pop operations respectively.
12. Write a program to evaluate a postfix expression.
13. Write a program to implement a queue and show the following: insertion and deletion.
14. Write a program to implement a circular queue and show the following: insertion and deletion.
15. Write a program to implement Linear Linked List and show the following operations: creation, display, insertion, deletion and searching.
16. Write a program to increment the data part of every node in a linked list by 10.
17. Write a program to implement a stack using linked list and show the following operations: Push, Pop, and Display.
18. Write a program to implement a stack using linked list and show the following operations: Insertion, Deletion, and Display.
19. Write a program to count the number of repetitions of a number in a linked list.
20. Write a program to implement Doubly Linked List and show the following operations: creation, display, insertion, deletion and searching.
21. Write a program to implement Binary tree and display the contents using preorder, postorder and inorder traversal techniques.
22. Write a program to convert a Binary Tree to a Threaded Binary Tree.
23. Write a program to construct a Binary Search tree and perform the following operations: Insertion and Deletion of a node.
24. Write a program to construct an AVL tree and perform the following operations: insertion, deletion and searching.
25. Write a program to insert and delete nodes in a graph using adjacency matrix.
26. Write a program that demonstrates Warshall‟s algorithm.
27. Write a program to implement Depth First Search using linked representation of graph.
28. Write a program to implement Breadth First Search using linked representation of graph.
29. Write a program to create a minimum spanning tree using Kruskal‟s algorithm
30. Write a program to create a minimum spanning tree using Prim‟s algorithm.

## Examination Scheme:

| IA | | | | EE | |
|---|---|---|---|---|---|
| A | PR | LR | V | PR | V |
| 5 | 10 | 10 | 5 | 35 | 35 |

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# NETWORKING FOR HOME & SMALL BUSINESS

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA230 | 2 | 1 | 0 | 3 |

**Course Objective:**
This course is aimed to provide a fundamental understanding of Computer Networking, Operating System, Connecting to the networks, network addressing, network services and Wireless technologies etc. After the completion of the course you will understand the core concepts around which computer networks revolve.

**Course Contents:**

**Module I: Personal Computer Hardware**
Personal Computers and Applications, types of Computers, Binary Representation of Data, Computer Components and Peripherals, Computer System Components

**Module II: Operating System**
Choosing the Operating Systems, Installing the Operating System, Maintaining the Operating System.

**Module III: Connecting to the Networks**
Introduction to Networking, Principals of Communication, Communicating on a Local Wired Network, Building the Access Layer of an Ethernet Network, Building the Distribution Layer of Network, Plan and Connect a Local Network

**Module IV: Connecting to the Internet through ISP**
The Internet and How We Connect To It Sending Information across the Internet
Networking Devices in a NOC Cables and Connectors Working with Twisted Pair Cabling

**Module V: Network Addressing**
Addresses and Subnet Masks, Types of IP Addresses, How IP Addresses are obtained
Address Management

**Module VI: Network Services**
Clients/Servers and Their Interactions, Application Protocols and Services, Layered Model and Protocols

**Module VII: Wireless Technologies**
Wireless Technology, Wireless LANs, Security Considerations on a Wireless LAN
Configuring an Integrated AP and Wireless Client

**Module VIII: Basic Security**
Networking Threats, Methods of attack, Security Policy, Using Firewalls

**Module IX: Trouble Shooting your Network**
Troubleshooting Process, Troubleshooting Issues, Common Issues, Troubleshooting and the Helpdesk

**Examination Scheme:**

| Components | CT1 | A/C/Q | ATTD. | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- CCNA-Discovery 4.0, module 1, Cisco Certified Networking Academy

*References:*
- Data Communication and Computer Network, Forozoun, TMH Publication
- Data Communication and Network, Stallings, PHI

- Computer Network, Tanenbaum, PHI
- Data Communication and Network, Stallings, PHI
- Computer Network, Tanenbaum, PHI

# INTERNET FUNDAMENTALS

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA231 | 2 | 1 | 0 | 3 |

**Course Objective:** The course provides introduction to internet and a deep insight into the basics of internet, world wide web, security risks over internet, basics of various languages used over internet. With this course students would be able to know the basics of each and every introductory internet and computer features which would prove to be very helpful throughout their degree, and would prove helpful in understanding other related subjects also.

**Course Contents:**

**Module 1: Internet Basics**
Introduction to Internet, History of Internet, Internet Working, Modes of Connecting to Internet, Internet Service Providers(ISPs), Differentiate between Internet, Intranet and Extranet, Protocol, Internet address, IP addressing, standard address, domain name, DNS, internet tool, TCP/IP and UDP, OSI reference model.

**Module 2: Electronic Mail**
Introduction to E-mail, advantages and disadvantages of e-mails, structure of an e-mail address, message components, message composition, mailer features, Internal working of E-mail, E-mail management, MIME types, Newsgroups, mailing lists, chat rooms, secure-mails, SMTP,POP, PICO, Pine, Gopher.

**Module 3: World Wide Web**
Introduction to www, Miscellaneous Web Browser details, searching www: Search engines and meta search engines, search fundamentals, search strategies, working of search engines, Telnet, FTP, HTTP, Introduction to Browser, Coast-to-coast surfing, HTML, Web page installation and setup , Basics of HTML, formatting & hyperlink creation. Using and installing Plug-ins.

**Module 4: Introduction to Languages and Servers**
Basics of java script language, Client/Server Side Programming in java script, Using Forms and data entry using java script, XML and DHTML basics, Creating Static and dynamic web pages. Web Servers: PWS, IIS, Apache, Advantages and limitations of using these servers.

**Module 5: Privacy and security**
Introduction to security over internet,Network Attacks, security and privacy levels, security policy, virus worms andd Trozan horses, Cryptography: Encryptionand Decryption techniques, SecureWeb document, Digital Signatures, Firewalls and its types, IDS.

**Examination Scheme:**

| Components | CT1 | A/C/Q | ATTD. | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

**Text & References:**
*Text:*
- Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp – 2001, TMH
- Internet & World Wide Programming, Deitel,Deitel & Nieto, 2000, Pearson Education

*References:*
- Complete idiots guide to java script,. Aron Weiss, QUE, 1997
- Atul Kahate, "Cryptography and Network Security", Tata McGraw-Hill, 2003

# PRODUCTION & OPERATIONS MANAGEMENT

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA232 | 2 | 1 | 0 | 3 |

## Course Objective:

The objective of the course is to obtain a general understanding of operations management environment, forecasting, demand and factor supply. In order to improve the competitiveness and productivity of an organization use of Linear Programming model, Implementing decisions related to product and service design, capacity planning, process selection and facility layout, location planning, MRP and Inventory. Role of Quality and its implementation in Organizations

## Course Contents:

**Module I: Introduction**
Introduction to Operations systems, Production systems definition, Operations Management Definition, difference, Historical Evolution of operations Management

**Module II: New Product Development**
Stages of New Product Development, Product Design and Service Design, Capacity Planning Decisions, its need and strategies for modifying capacity, Conceptual definition of Facility Location

**Module III: Layout and Aggregate Planning Concepts**
Layout concepts, Developing the Process Layout: Models and Behaviour, Production Planning and Control its need, Categories, Aggregate Planning Process: its concept and goals

**Module IV: Material Requirement Planning Systems**
Introduction to Materials Management, Material Requirements Planning Systems.
Applications of JIT.

**Module V: Quality Assurance and its Control**
Quality Assurance, Statistical Quality Control, Acceptance Sampling & Total Quality Management

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- Adam & Ebert, Production & Operations Management.

*References:*
- Buffa & Sarin, Modern Production / operations Management.
- Chase & Aquilano, Production & Operations Management.
- Render & Heizer, Principles of Operations Management.

# ENGLISH

| Course Code | L | T | P | Credit |
|-------------|---|---|---|--------|
| BCS201 | 1 | 0 | 0 | 1 |

## Course Objective:
The course is intended to give a foundation of English Language. The literary texts are indented to help students to inculcate creative & aesthetic sensitivity and critical faculty through comprehension, appreciation and analysis of the prescribed literary texts. It will also help them to respond form different perspectives.

## Course Contents:

**Module I: Vocabulary**
Use of Dictionary
Use of Words: Diminutives, Homonyms & Homophones

**Module II: Essentials of Grammar - I**
Articles
Parts of Speech
Tenses

**Module III: Essentials of Grammar - II**
Sentence Structure
Subject -Verb agreement
Punctuation

**Module IV: Communication**
The process and importance
Principles & benefits of Effective Communication

**Module V: Spoken English Communication**
Speech Drills
Pronunciation and accent
Stress and Intonation

**Module VI: Communication Skills-I**
Developing listening skills
Developing speaking skills

**Module VII: Communication Skills-II**
Developing Reading Skills
Developing writing Skills

**Module VIII: Written English communication**
Progression of Thought/ideas
Structure of Paragraph
Structure of Essays

**Module IX: Short Stories**
Of Studies, by Francis Bacon
Dream Children, by Charles Lamb
The Necklace, by Guy de Maupassant
A Shadow, by R.K.Narayan
Glory at Twilight, Bhabani Bhattacharya

**Module X: Poems**
All the Worlds a Stage                Shakespeare
To Autumn                             Keats
O! Captain, My Captain                Walt Whitman

| Where the Mind is Without Fear | Rabindranath Tagore |
| Psalm of Life | H.W. Longfellow |

## Examination Scheme:

| Components | A | CT | HA | EE |
|---|---|---|---|---|
| Weightage (%) | 05 | 15 | 10 | 70 |

## Text & References:

- MadhulikaJha, Echoes, Orient Long Man
- Ramon &Prakash, Business Communication, Oxford.
- Sydney Greenbaum Oxford English Grammar, Oxford.
- Successful Communications, MalraTreece (Allyn and Bacon)
- Effective Technical Communication, M. Ashraf Rizvi.

# BEHAVIOURAL SCIENCE - II

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BSS201 | 1 | 0 | 0 | 1 |

## Course Objective:
To enable the students:
Understand the process of problem solving and creative thinking.
Facilitation and enhancement of skills required for decision-making.

## Course Contents:

**Module I: Thinking as a tool for Problem Solving**
What is thinking: The Mind/Brain/Behaviour
Thinking skills
Critical Thinking and Learning:
Making Predictions and Reasoning
Memory and Critical Thinking
Emotions and Critical Thinking

**Module II: Hindrances to Problem Solving**
Perception
Expression
Emotion
Intellect
Work environment

**Module III: Problem Solving Process**
Recognizing and Defining a problem
Analyzing the problem (potential causes)
Developing possible alternatives
Evaluating Solutions
Resolution of problem
Implementation

**Module IV: Plan of Action**
Construction of POA
Monitoring
Reviewing and analyzing the outcome

**Module V: Creative Thinking**
Definition and meaning of creativity
The nature of creative thinking
Convergent and Divergent thinking
Idea generation and evaluation (Brain Storming)
Image generation and evaluation
Debating
The six-phase model of Creative Thinking: ICEDIP model

**Module VI: End-of-Semester Appraisal**
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

## Examination Scheme:

| Components | SAP | A | Mid Term Test (CT) | VIVA | Journal for Success (JOS) |
|---|---|---|---|---|---|
| Weightage (%) | 20 | 05 | 20 | 30 | 25 |

## Text & References:

- Michael Steven: How to be a better problem solver, Kogan Page, New Delhi, 1999
- Geoff Petty:  How to be better at creativity; Kogan Page, New Delhi, 1999
- Phil Lowe Koge Page: Creativity and Problem Solving, New Delhi, 1996
- Bensley, Alan D.: Critical Thinking in Psychology – A Unified Skills Approach, (1998), Brooks/Cole Publishing Company.

# FRENCH - II

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLF201 | 2 | 0 | 0 | 2 |

## Course Objective:
To enable the students to overcome the fear of speaking a language and take position as a foreigner speaking French. To make them learn the basic rules of French Grammar.

## Course Contents:

**Module A:pp.38 – 47: Unité 3: Objectif 3, 4, 5. 6**

**Module B: pp. 47 to 75 Unité 4, 5**

**Contenu lexical:** **Unité 3: Organiser son temps**
1. donner/demander des informations sur un emploi du temps, un horaire SNCF – Imaginer un dialogue
2. rédiger un message/ une lettre pour …
   i) prendre un rendez-vous/ accepter et confirmer/ annuler
   ii) inviter/accepter/refuser
3. Faire un programmed"activités
   imaginer une conversation téléphonique/un dialogue
   Propositions- interroger, répondre
**Unité 4: Découvrir son environnement**
1. situer un lieu
2. s"orienter, s"informer sur un itinéraire.
3. Chercher, décrire un logement
4. connaître les rythmes de la vie
**Unité 5: s"informer**
1. demander/donner des informations sur un emploi du temps passé.
2. donner une explication, exprimer le doute ou la certitude.
3. découvrir les relations entre les mots
4. savoir s"informer

**Contenu grammatical:** 1. Adjectifsdémonstratifs
2. Adjectifs possessifs/exprimer la possession à l"aide de:
   i. « de » ii. A+nom/pronom disjoint
3. Conjugaison pronominale – négative, interrogative - construction à l'infinitif
4. Impératif/exprimer l"obligation/l"interdiction à l"aide de « il faut…. »/ «il ne faut pas… »
5. passé composé
6. Questions directes/indirectes

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

- le livre à suivre: Campus: Tome 1

# GERMAN – II

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLG201 | 2 | 0 | 0 | 2 |

## Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Grammar to consolidate the language base learnt in Semester I

## Course Contents:

**Module I: Everything about Time and Time periods**
Time and times of the day.
Weekdays, months, seasons.
Adverbs of time and time related prepositions

**Module II: Irregular verbs**
Introduction to irregular verbs like to be, and others, to learn the conjugations of the same, (fahren, essen, lessen, schlafen, sprechen und ähnliche).

**Module III: Separable verbs**
To comprehend the change in meaning that the verbs undergo when used as such
Treatment of such verbs with separable prefixes

**Module IV: Reading and comprehension**
Reading and deciphering railway schedules/school time table
Usage of separable verbs in the above context

**Module V: Accusative case**
Accusative case with the relevant articles
Introduction to 2 different kinds of sentences – Nominative and Accusative

**Module VI: Accusative personal pronouns**
Nominative and accusative in comparison
Emphasizing on the universal applicability of the pronouns to both persons and objects

**Module VII: Accusative prepositions**
Accusative propositions with their use
Both theoretical and figurative use

**Module VIII: Dialogues**
Dialogue reading:   „In the market place"
                    „At the Hotel"

Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler,  Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

# SPANISH – II

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLS201 | 2 | 0 | 0 | 2 |

## Course Objective:

To enable students acquire more vocabulary, grammar, Verbal Phrases to understand simple texts and start describing any person or object in Simple Present Tense.

## Course Contents:

**Module I**
Revision of earlier modules.

**Module II**
Some more AR/ER/IR verbs. Introduction to root changing and irregular AR/ER/IR ending verbs

**Module III**
More verbal phrases (eg, Dios Mio, Que lastima etc), adverbs *(bueno/malo, muy, mucho, bastante, poco)*.
Simple texts based on grammar and vocabulary done in earlier modules.

**Module IV**
Possessive pronouns

**Module V**
Writing/speaking essays like my friend, my house, my school/institution, myself….descriptions of people, objects etc, computer/internet related vocabulary

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

- Español, En Directo I A
- Español Sin Fronteras

# CHINESE – II

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLC201 | 2 | 0 | 0 | 2 |

## Course Objective:

Chinese is a tonal language where each syllable in isolation has its definite tone (flat, falling, rising and rising/falling), and same syllables with different tones mean different things. When you say, "ma" with a third tone, it mean horse and "ma" with the first tone is Mother. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

## Course Contents:

**Module I**
Drills
Practice reading aloud
Observe Picture and answer the question.
Tone practice.
Practice using the language both by speaking and by taking notes.
Introduction of basic sentence patterns.
Measure words.
Glad to meet you.

**Module II**
Where do you live?
Learning different colors.
Tones of "bu"
Buying things and how muchit costs?
Dialogue on change of Money.
More sentence patterns on Days and Weekdays.
How to tell time.Saying the units of time in Chinese. Learning to say useful phrases like – 8:00, 11:25, 10:30 P.M.
everyday, afternoon, evening, night, morning 3:58, one hour, to begin, to end ….. etc.
Morning, Afternoon, Evening, Night.

**Module III**
Use of words of location like-li, wais hang, xia
Furniture – table, chair, bed, bookshelf,..etc.
Description of room, house or hostel room..eg what is placed where and how many things are there in
it? Review Lessons – Preview Lessons.
Expression „yao", "xiang" and "yaoshi" (if).
Days of week, months in a year etc.
I am learning Chinese. Is Chinese difficult?

**Module IV**
Counting from 1-1000
Use of "chang-chang".
Making an Inquiry – What time is it now? Where is the Post Office?
Days of the week.Months in a year.
Use of Preposition – "zai", "gen".
Use of interrogative pronoun – "duoshao" and "ji".
"Whose"??? Sweater etc is it?
Different Games and going out for exercise in the morning.

**Module V**
The verb "qu"
~ Going to the library issuing a book from the library
~ Going to the cinema hall, buying tickets
~ Going to the post office, buying stamps
~ Going to the market to buy things..etc
~ Going to the buy clothes …. Etc.
Hobby. I also like swimming.

Comprehension and answer questions based on it.

**Examination Scheme:**

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

- "Elementary Chinese Reader Part I" Lesson 11-20

# COMPUTER ORIENTED STATISTICAL & OPTIMIZATION METHODS

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA301 | 2 | 1 | 0 | 3 |

## Course Objective:

The objective of this course is to expose students to the fundamentals and concepts of statistical and optimization methods, in particular, with reference to frequency distribution and measures of central tendency, measures of dispersion, skew ness and kurtosis, theory of probability, linear programming problems, transportation, assignment and game problems. This course is designed with an aim of helping the students to understand important theorems, different formulae and practical applications of these statistical and optimization methods in the field of Computer Sciences and Applications.

## Course Contents:

**Module I**
Collection of Data, Sampling and Sampling Designs, Classification and Tabulation of Data, Graphical representation of Data, Measures of Central Value, Measures of Dispersion. Moments, Skewness, Kurtosis, Correlation and Regression.

**Module II: Probability**
Classical Definition of Probability,Algebra of Events, Probability Axoims, Conditional Probability.
**Probability Distributions:** Discrete and Continuous Distributions, Binomial Distribution, Poisson distribution, Normal Distribution.

**Module III:Linear Programming**
Mathematical Formulation of Linear Programming models and its Graphical Solutions, Simplex Method, Charne"s Big M method, Two Phase Method.

**Module IV: Transportation Problem**
General Transportation model, Starting basic Solutions:-North west Corner Method, Least Cost Method, Vogel"s Approximation Method, Test of optimality, unbalanced Problem, Assignment Problems.
**Assignment Problems**

**Module V:Game Theory**
Two-Person Zero Sum Games, Maximin-Minimax Principal, Pure Strategies, Mixed Strategies, Expected Pay off, Concept of Dominence, Graphical Solution of m  X 2 and 2  X n Games.

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- P.K. Gupta &Manmohan, Linear Programming and Theory of Games.
- S.C Gupta & V.K. Kapoor, Fundamentals of Mathematical Statistics.

*References:*
- Hogg, Probability and Statistical Inference.
- Alexander. M. Mood, Introduction to the Theory of Statistics
- Franklin. A. Graybill, Dane. C. Boes
- Taha, Handy A, Operations Research
- G. Hadley, Linear Programming.

# OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA302 | 2 | 1 | 0 | 3 |

## Course Objective:

C++ is one of the most widely used programming languages for solving problems. The objective of this course is to provide object oriented programming fundamentals using C++. Topics to be covered include fundamentals of syntax & semantics of C++, loops & decisions, functions, classes and structures and features of classes such as overloading and inheritance, files, streams, pointers etc.

## Course Contents:

### Module I: Overview of C++
What is Object Oriented Programming, Characteristics of OOP, Difference between C and C++.
Basics:-Input/Output in C++ using cin/cout, Preprocessor Directives, Data Types-Integer, Float, character, Enumerated data types, library functions, comments, storage classes, manipulators, type conversion, arithmetic operators, arrays and strings

### Module II: Loops and Decisions
Relational operators, Logical operators, Decisions-if, if-else and switch. Loops-for, while, do-while and nested loops, precedence summary, break, continue and goto statements.
Functions: Simple functions, passing arguments to functions, returning values from functions, reference arguments, returning by reference, Overloaded functions, Inline functions

### Module III: Structures
A simple Structure, specifying the Structure, defining the structure variable, assessing members of structure, structure within structure, assessing structure members using pointers
Classes and objects: A simple class, C++ objects as physical objects, Constructors, Destructors, objects as function arguments, returning objects from functions, static class data, array as class data member, array of objects.

### Module IV: Operator Overloading & Inheritance
Overloading unary operator, Overloading binary operator, data conversion. Inheritance: Derived and Base class, Derived class Constructor, types of Inheritance , Abstract base class , public and private Inheritance, level of Inheritance, Ambiguity in multiple inheritance .

### Module V: Pointers and Virtual functions
Pointers and Arrays, pointers and strings, pointers and functions, pointers to objects, virtual functions, friend functions, static functions, this pointer.
Files and Streams: streams, string I/O, character I/O, object I/O, file pointer, error handling, command line arguments.

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

- Programming with C++, Ravi Chandran
- Mastering C++, Venugopal
- Programming in C++, SCHAUM"s series
- The complete reference C++, Herbert Schildt
- Turbo C++, Robert Lafore

# DATABASE MANAGEMENT SYSTEMS

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA303 | 2 | 1 | 0 | 3 |

## Course Objective:

The objective of this course is to expose the students to the fundamentals & basic concepts in Data Base Management Systems. This course discusses architecture of Database Systems with concept of relational model & ER model. This course explains techniques for database design, Normalization and database recovery and protection.

## Course Contents:

### Module I: Introduction to DBMS
Definition of DBMS, Data Independence, DBMS Architecture, Levels, Database Administrator, File System Approach Vs DBMS Approach, Advantages of Using a DBMS, Data Models, Schemas, and Instances.

### Module II: Relational Database & ER Model
Relational System, Codd"s Rule, Relational Model, Optimization, Tables and Views, Entity, Types of Entity, Weak Entity Attributes, Entity sets, Entity – Relationship Diagrams.

### Module III: Relational Model Objects
Domains and Relations, Relations and predicates, Relational Data Integrity; Primary Key, Candidate Key, Foreign Key and their rules; Relational operators, Relational Algebra, Relational Calculus, SQL Language, Data definition, Data retrieval and update operations.

### Module IV: Database Design
Definition Of Functional Dependencies, Process Of Normalization, First Normal Form, Second Normal Form, Third Normal Form. BoyceeCodd Normal Form, Fourth Normal Form, Fifth Normal Form.

### Module V: Data Recovery & Protection
Recovery- Transaction recovery, System recovery, Media Recovery, Concurrency Control Techniques, Locking, Dead Lock, Serializability; Security- Introduction.

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

- Elmasari, Navathe, "Fundamentals of Database Systems", Addision Wesley.
- Korth, Silbertz, Sudarshan, "Database Concepts". McGraw Hill.
- Majumdar& Bhattacharya, "Database Management System", Tata McGraw Hill.
- Date C J." An Introduction to Database Systems", Addision Wesley.

# SUMMER PROJECT – I (EVALUATION)

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA360 | 0 | 0 | 0 | 6 |

## Course Objective:

The objective of project work is to provide students, exposure about the technology they have learnt in previous and current semesters and their applications in real time situations. Appropriate application software as assigned by the project guide to be developed individually or in-groups.

They are supposed to follow the following technologies:
C,
C++
DBMS

## Guidelines:

There are certain phases of every Intern"s professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship program can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal classroom situations. These attributes are intellectual ability, professional judgment and decision-making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

In order to achieve these objectives, each student will maintain a file (**Internship File**). The Internship File aims to encourage students to keep a personal record of their learning and achievement throughout the Programme. It can be used as the basis for lifelong learning and for job applications. Items can be drawn from activities completed in the course modules and from the workplace to demonstrate learning and personal development.

The File will assess the student"s analytical skills and ability to present supportive evidence, whilst demonstrating understanding of their organization, its needs and their own personal contribution to the organization.

The **layout guidelines** for the Project & Seminar Report:

### 1. File should be in the following specification
- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

**2. Report Layout:** The report should contain the following components
Front Page
Table of Content
Acknowledgement Student
Certificate Company
Profile (optional)
Introduction
Main Body
References / Bibliography

The File will include *five sections* in the order described below. The content and comprehensiveness of the main body and appendices of the report should include the following:

1. **The Title Page**--Title - An Internship Experience Report For (Your Name), name of internship organization, name of the Supervisor/Guide and his/her designation, date started and completed, and number of credits for which the report is submitted.

2. **Table of Content**--an outline of the contents by topics and subtopics with the page number and location of each section.

3. **Introduction**--short, but should include how and why you obtained the internship experience position and the relationship it has to your professional and career goals.

4. **Main Body**--should include but not be limited to daily tasks performed. Major projects contributed to, dates, hours on task, observations and feelings, meetings attended and their purposes, listing of tools and materials and their suppliers, and photographs if possible of projects, buildings and co-workers.

5. **References / Bibliography** --This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system

**ASSESSMENT OF THE INTERNSHIP FILE**

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Internship File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student"s own work. It will also ensure regularity and meeting the delaines.

**STUDENT ASSESSMENT RECORD (SAR)**

1.   **Range of Research Methods used to obtain information**

2.   **Execution of Research**

3.   **Data Analysis**
      - Analyse Quantitative/ Qualitative information
      - Control Quality

4.   **Draw Conclusions**

## Examination Scheme:

| Components | V | S | R | FP |
|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 40 |

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

# Object Oriented Programming Concepts using C++ LAB

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA320 | 0 | 0 | 2 | 1 |

## List of C++ Programmes:

1. WAP to find greatest of three numbers.
2. WAP to calculate factorial of a number.
3. WAP to print Fibonacci series of „n" numbers , where n is given by the programmer
4. WAP to check whether a number is prime or not.
5. WAP to find the number of characters and words in a string.
6. WAP to read a set of numbers in an array & to find the largest of them.
7. WAP to implement bubble sort using arrays.
8. WAP to read a set of numbers from keyboard & to find sum of all elements of the given array using a function.
9. WAP to exchange contents of two variables using call by value.
10. WAP to exchange contents of two variables using call by reference.
11. WAP to find the sum of three numbers using pointer to function method.
12. WAP to display content of an array using pointer arithmetic.
13. Calculate area of different geometrical figures (circle, rectangle, square, triangle) using function overloading.
14. WAP a program ro maintain the student record containing roll number , Name, marks1, marks2, marks3 as data member and getdata(), display() and setdata() as member functions(use array of object)
15. WAP to increment the employee salaries on the basis of there designation (Manager-5000, General Manager-10000, CEO-20000, worker-2000). Use employee name, id, designation, salary as data member and inc_sal as member function (Use array of object).
16. Write a class bank, containing data member: Name of Depositor, A/c type, Type of A/c, Balance amount. Member function: To assign initial value, To deposit an amount, to withdraw an amount after checking the balance (which should be greater than Rs. 500) , To display name & balance.
17. WAP to define nested class „student_info" which contains data members such as name, roll number and sex and also consists of one more class „date" ,whose data members are day, month and year. The data is to be read from the keyboard & displayed on the screen.
18. WAP to generate a series of Fibonacci numbers using copy constructor, where it is defined outside the class using scope resolution operator.
19. Write a program to add two complex numbers using friend function.
20. Write a class string to compare two strings, overload (= =) operator.
21. Write a class to concatenate two strings, overload (+) operator.
22. Create a class item, having two data members x & y, overload „-„(unary operator) to change the sign of x and y.
23. Create a class Employee. Derive 3 classes from this class namely, Programmer, Analyst & Project Leader. Take attributes and operations on your own. Write a program to implement this with array of pointers.
24. Create two classes namely Employee and Qualification. Using multiple inheritance derive two classes Scientist and Manager. Take suitable attributes & operations. Write a program to implement this class hierarchy.
25. Write a program to read data from keyboard & write it to the file. After writing is
26. Completed, the file is closed. The program again opens the same file, reads

## Examination Scheme:

| IA | | | | EE | |
|---|---|---|---|---|---|
| A | PR | LR | V | PR | V |
| 5 | 10 | 10 | 5 | 35 | 35 |

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# Database Management Systems LAB

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA321 | 0 | 0 | 2 | 1 |

## List of DBMS Programmes:

1. Given the table STUDENT:

| Student No. | Class | Name | GAME | Grade1 | SUPW | Grade2 |
|---|---|---|---|---|---|---|
| 10 | 7 | Sameer | Cricket | B | Photography | A |
| 11 | 8 | Sujit | Tennis | A | Gardening | C |
| 12 | 7 | Kamal | Swimming | B | Photography | B |
| 13 | 7 | Veena | Tennis | C | Cooking | A |
| 14 | 9 | Archana | Basket Ball | A | Literature | A |
| 15 | 10 | Arpit | Cricket | A | Gardening | C |

(i)   Display the names of the students who are getting a grade C in either GAME or SUPW.
(ii)  Display the number of students getting grade A in cricket.
(iii) Display the different games offered in the school.
(iv)  Display the SUPW taken by the students, whose name starts with „A".
(v)   Add a new column named „Marks".
(vi)  Assign a value 200 for Marks for all those who are getting grade B or above in GAME.
(vii) Arrange the whole table in the alphabetical order to SUPW.

2. Given the table SPORTS:

| Student No. | Class | Name | GAME1 | Grade1 | GAME2 | Grade2 |
|---|---|---|---|---|---|---|
| 10 | 7 | Sameer | Cricket | B | Swimming | A |
| 11 | 8 | Sujit | Tennis | A | Skating | C |
| 12 | 7 | Kamal | Swimming | B | Football | B |
| 13 | 7 | Veena | Tennis | C | Tennis | A |
| 14 | 9 | Archana | Basket Ball | A | Cricket | A |
| 15 | 10 | Arpit | Cricket | A | Athletics | C |

(i)   Display the names of the students who are getting a grade C in either GAME1 or GAME2.
(ii)  Display the number of students getting grade A in cricket.
(iii) Display the names of the students who have same game for both GAME1 and GAME2.
(iv)  Display the games taken by the students, whose name starts with „A".
(v)   Add a new column named „Marks".
(vi)  Assign a value 200 for Marks for all those who are getting grade B or above in GAME.
(vii) Arrange the whole table in the alphabetical order of Name.

3. Given the table STUDENT:

| Student No. | Name | Stipend | Stream | AvgMarks | Grade | Class |
|---|---|---|---|---|---|---|
| 1 | Karan | 400.00 | Medical | 78.5 | B | 12B |
| 2 | Divakar | 450.00 | Commerce | 89.2 | A | 11C |
| 3 | Divya | 300.00 | Commerce | 68.6 | C | 12C |
| 4 | Arun | 350.00 | Humanities | 73.1 | B | 12C |
| 5 | Sabina | 500.00 | Nonmedical | 90.6 | A | 11A |
| 6 | John | 400.00 | Medical | 75.4 | B | 12B |
| 7 | Robert | 250.00 | Humaities | 64.4 | C | 11A |
| 8 | Rubina | 450.00 | Nonmedical | 88.5 | A | 12A |
| 9 | Vikas | 500.00 | Nonmedical | 92.0 | A | 12A |
| 10 | Mohan | 300.00 | Commerce | 67.5 | C | 12C |

(i)   Select all the Nonmedical stream students from STUDENT.
(ii)  List the names of those students who are in class 12 sorted by Stipend.
(iii) List all students sorted by AvgMarks in descending order.

(iv)     Display a report listing Name, Stipend, Stream, and amount of Stipend received in a year assuming that the stipend is paid every month.

(v)     Count the number of students with Grade „A".

(vi)     Insert a new student in the STUDENT table and fill all the columns with some values.

(vii)     Give the output of the following SQL statements:

     (a) Select MIN(AvgMarks) from STUDENT where AvgMarks> 75;

     (b) Select SUM(Stipend) from STUDENT where Grade = „B";

     (c) Select AVG(Stipend) from STUDENT where Class = „12A";

     (d) Select COUNT(DISTINCT);

4.    Write SQL statement to create EMPLOYEE relation which containEmpNo, Name, Skill, PayRate.

5.    Create a table with the under-mentioned structure (Table name is Emp)

    EmpNoNUMBER(4)
    DeptNoNUMBER(2)
    EmpNameCHAR(10)
    JobCHAR(10)
    ManagerNUMBER(4)
    HireDateDATE
    Salary          NUMBER(7, 2)
    Commission    NUMBER (7, 2)

6. Find out the number of employees having manager as job.

7. Display only the jobs with maximum salary greater than or equal to 3000.

8. Find all those employees whose job does not start with „M".

9. List the minimum and maximum salary of each job type.

10. Find all the employees who have no manager.

11. Create a table with the under-mentioned structure (Table name is Dept)

    DeptNo          NUMBER(2)
    DeptName        CHAR(12)
    Location         CHAR(12)

12. Create a table with the under-mentioned structure (Table name is PROJECT)

    ProjIdNUMBER(4)
    ProjDesigCHAR(20)
    ProjStartDTDATE
    ProjEndDTDATE
    BudgetAmount    NUMBER(7)
    MaxNoStaff      NUMBER(2)

13. Create a table with the under-mentioned structure (Table name is SalGrade)

    LowSal          NUMBER(7, 2)
    HighSal         NUMBER(7, 2)
    Grade           NUMBER(2)

Where LowSal is the lowest salary limit in the grade and HighSal is the highest salary limit in the grade.

14. Write SQL statements to list all employees in the following format:

    EMPLOYEE WORKS IN DEPARTMENT    Dept. No
    SMITH WORKS IN DEPARTMENT       20
    SUDHIR WORKS IN DEPARTMENT     20
    RAJWORKS IN DEPARTMENT         10
    SMITHS WORKS IN DEPARTMENT     30
    SANTOSH WORKS IN DEPARTMENT    30

15. Given the table MOV:

| No. | Title | Type | Rating | Stars | Qty | Price |
|-----|-------|------|--------|-------|-----|-------|
| 1 | Gone with the Wind | Drama | G | Gable | 4 | 39.95 |
| 2 | Friday the 13th | Horror | R | Jason | 2 | 69.95 |
| 3 | Top Gun | Drama | PG | Cruise | 7 | 49.95 |
| 4 | Splash | Comedy | PG13 | Hanks | 3 | 29.95 |
| 5 | Independence Day | Drama | R | Turner | 3 | 19.95 |
| 6 | Risky Business | Comedy | R | Cruise | 2 | 44.95 |
| 7 | Cocoon | Scifi | PG | Ameche | 2 | 31.95 |
| 8 | Crocodile Dundee | Comedy | PG13 | Harris | 2 | 69.95 |
| 9 | 101 Dalmations | Comedy | G | | 3 | 59.95 |
| 10 | Tootsie | Comedy | PG | Hoffman | 1 | 29.95 |

Find the total value of the movie cassettes available I the library.
Display a list of all movies with Price over 20 and sorted by Price.
Display all the movies sorted by Qty in descending order.
Display a report listing a movie number, current value and replacement value for each movie in the above table.
Calculate the replacement value for all movies as Qty * Price * 1.15.
Count the number of movies where rating is not „G".
Insert a new movie in the MOV table. Fill all the columns with some values.
Give the output of the following SQL statements:
Select AVG (Price) from MOV where Price < 30;
Select MAX (Price) from MOV where Price > 30;
Select SUM (Price * Qty) from MOV where Qty< 4;
Select COUNT (DISTINCT);

## Examination Scheme:

| IA | | | | EE | |
|----|----|----|---|----|---|
| **A** | **PR** | **LR** | **V** | **PR** | **V** |
| 5 | 10 | 10 | 5 | 35 | 35 |

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# WORKING AT A SMALL-TO-MEDIUM BUSINESS OR ISPs

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA330 | 2 | 1 | 0 | 3 |

## Course Objective:
This course is aimed to provide a fundamental understanding of small to medium business or ISP. After the completion of this, students will know how to plan network upgrade, planning the addressing structure, configuring the network devices and ISP services.

## Course Contents:

**Module I: The Internet and Its Uses**
What is the Internet, Internet Service Providers, and ISP Connectivity

**Module II: ISP Help Desk**
 Help Desk Technicians, OSI Model, ISP Troubleshooting

**Module III: Planning a Network Upgrade**
Common Issues, Planning the Network Upgrade, Purchasing and Maintaining Equipment

**Module IV: Planning the addressing structure**
IP Addressing in the LAN, NAT and PAT

**Module V: Configuring Network Devices**
Initial ISR Router Configuration, Configuring an ISR with SDM, Configuring a Router Using IOS CLI, Initial Cisco 2960 Switch Configuration, Connecting the CPE to the ISP
*Module VI: Routing*
Enabling Routing Protocols, Exterior Routing Protocols

**Module VII: ISP Services**
Introducing ISP Services, Protocols that Support ISP Services, Domain Name Service
Services and Protocols
*Module VIII: ISP Responsibilities*
ISP Security Considerations, Security Tools, Monitoring and Managing the
ISP Backups and Disaster Recovery

**Examination Scheme:**

| Components | CT1 | A/C/Q | ATTD. | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

**Text & References:**

**Text:**
- CCNA-Discovery 4.0,  module 2,  Cisco Certified Networking Academy

**References:**
- Data Communication and Computer Network, Forozoun, TMH Publication
- Data Communication and Network, Stallings, PHI
- Computer Network, Tanenbaum, PHI

# WEB DESIGNING

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA331 | 2 | 1 | 0 | 3 |

**Course Objective:**
This course is aimed to provide a fundamental understanding of web site creation. HTML is the language used for designing most basic web pages. Syllabus include basic and advanced features of HTML which includes images, links, tables, frames and forms etc. It also gives an overview of XML.

**Course Contents:**
**Module I: Introduction to html programming**
History of HTML, Structure of HTML, Adding Comments, Formatting Text, Creating List, Creating Definition List, Creating Hyper Text Links, Creating Link Lists, Inserting Inline Images, Creating Image Links, Horizontal Rules, Address Tag, Working with Text
Changing font Sizes and Colors, Using Background Image, Marquee Tag.

**Module II**
Tables and frames, Creating Tables, Table Element, Adding Border, Adding Column Headings, Adding Spacing and Padding, Adding a Caption, Setting the table Width and Height, Add Row Headings, Aligning Cell contents, Setting Column Width, Centering a Table, Inserting and Image, Spannig Columns, Spanning Rows Assigning Backgroung Colors, Frame Elements, Creation of Frame Based Pages, Noframes Element.

**Module III**
Forms and Java Script Introduction to Forms, Form Elements, Front level validations using JavaScript

**Module IV**
Cascading style sheets, Overview of style sheets, Different ways to use style sheets, Selectors DIV and SPAN Elements, Adding style to a Document, Use id Classes and Ids, Style Sheet Properties.

**Module V: XML**
Introduction to XML, XML Basics, XML Structure, Developing a DTD from XML code, Viewing XML, Viewing XML using the XML Data Source Object, Viewing XML using Style Sheets.

**Examination Scheme:**

| Components | CT1 | A/C/Q | ATTD. | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

**Text & References:**

*Text:*
- HTML, DHTML, JavaScript, Perl, CGI, Ivan Bayross, BPB Publication.

*References:*
- HTML Complete Reference, BPB Publication.
- Internet for everyone, Alexis Leon and Mathew Leon, Leon Tech world.

# ACCOUNTING & FINANCIAL MANAGEMENT

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA332 | 2 | 1 | 0 | 3 |

**Course Objective:**
The objective of this course is to provide to students of IFT and IMCA with an introduction to fundamentals, concepts and principles / practices of Accounting and Financial Management. The topics covered including basic accounting, preparation of Trial Balance, Profit and Loss Account and Balance Sheet Account as applied to Banking including Bank Reconciliation Statement, Definition and Principles of Working Capital Management, Capital Budgeting and Analysis of Financial Statements.

**Course Contents:**

**Module I: Accounting**
Definition of Accounting, Its Objectives, Advantages and Limitation. Principles, Concepts and Conventions of Accounting, Double entry system, Recording of Transactions in subsidiary Books – Journal, Cash Book, sales Book, Purchase Book and Return Book. Posting into Ledger accounts.

**Module II: Final Accounts**
Preparation of Trial balance, Final Accounts including adjustments Trading account, Profit and Loss account, Balance Sheet.

**Module III: Banking**
Opening of different types of Banks Accounts, Cheque Book, Pass Book, Deposit slips, Bank Reconciliation Statements.

**Module IV: Working Capital Management**
Definition of working Capital, Types of Working Capital, Determinants of working Capital, Cash Management and Receivables Management.
Capital Budgeting: Principles and Techniques.

**Module V: Analysis of Financial statements**
Ratio Analysis: Meaning, Advantages, limitations, types of ratios and their usefulness Statements of charges in the Financial Position on Cash basis.

| Examination Scheme: Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 10 | 15 | 5 | 70 |

# ADVANCE TECHNOLOGIES IN COMPUTER SCIENCE

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA333 | 2 | 1 | 0 | 3 |

**Course Objective**

The objective is of this course to make aware the students about emerging technologies and areas in computer science viz Soft computing, Parallel computing, Pervasive computing, High performance computing and Quantum Computing.

**Course Contents**

**Module I: Soft Computing**

Introduction of soft computing, soft computing vs. hard computing, various types of soft computing techniques, applications of soft computing.

**Module II: Green Computing**

Introduction to Green Computing, Websites, statistics, and government initiatives, Reducing the IT footprint, Computing technology for greener transportation, smarter buildings, Major green initiatives: Sustainable IT, Green Business, Smarter Plant

**Module III: Internet of Things**

Introduction – Concepts behind the Internet of Things, Trends and characteristics, Technologies behind the Internet of Things, Creative thinking techniques, application areas

**Module IV: Civic technology**

Civic technology, Smart city, e-democracy, open data, intelligent environment

**Module V: Emerging Technologies**

Brief introduction to emerging technologies: Quantum Computing, Parallel Computing, Pervasive Computing, High Performance Computing, Cluster computing, cloud computing, Super Computing

**Examination Scheme:**

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

**Text & References:**

- Internet and Emerging Technologies 2nd Edition, by FADAIRO SIKIRUA (Author), MOORNING KIM
- Advanced Technologies: Building in the Computer Age (The Information Technology Revolution in Architecture) Paperback – June 1, 2001 by Valerio Travi

# MARKETING MANAGEMENT

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA334 | 2 | 1 | 0 | 3 |

**Course Objective:**
This course aims at providing the insight of the market trends and strategies in order to prepare the students for the challenges ahead.

**Course Contents:**

**Module I: Understanding Marketing Management**
Marketing Tasks, Marketing Concepts and Tools, Company Orientation towards Market
Place Building Customer Satisfaction, Value and Retention
Winning Markets: Market Oriented Strategic Planning, Corporate and Divisio Strategic Planning, Business Strategic Planning, Market Process

**Module II: Analyzing Market Opportunities**
Gathering Information and Measuring Market Demand: Components of Modern Marketing Information System
Scanning Marketing Environment: Demographic, Economic, Natural, Technological, Political-Legal, Social-Cultural environments.
Analyzing Consumer Markets and Buyer Behaviour: Major Factors influencing Buyer behaviour; cultural, social, personal, psychological; Buying Decision Process; Stages of Buying Decision Process
Analyzing Business Markets and Business Buying Behaviour: What is organizational buying, Participants in Business Buying Process, Purchasing-Procurement Process, Institutional and Government Markets
Dealing with Competition: Identifying Competitors, Analyzing Competitors, Designing Competitive Intelligence System, Designing Competitive Strategies

**Module III: Developing Marketing Startegies**
Positioning the Market Offering Through the Product Life Cycle: Differentiation Tools, Developing and Communicating Positioning Strategy, Product Life-Cycle Marketing Strategies, Market Evolution

**Examination Scheme:**

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

**Text & References:**

- Marketing Management, Phillip Kotler, Prentice-Hall India

# ENVIRONMENTAL STUDIES

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| EVS001 | 4 | 0 | 0 | 4 |

## Course Objective:

The term environment is used to describe, in the aggregate, all the external forces, influences and conditions, which affect the life, nature, behaviour and the growth, development and maturity of living organisms. At present a great number of environment issues, have grown in size and complexity day by day, threatening the survival of mankind on earth. A study of environmental studies is quite essential in all types of environmental sciences, environmental engineering and industrial management. The objective of environmental studies is to enlighten the masses about the importance of the protection and conservation of our environment and control of human activities which has an adverse effect on the environment.

## Course Contents:

### Module I: The multidisciplinary nature of environmental studies
Definition, scope and importance
Need for public awareness

### Module II: Natural Resources
**Renewable and non-renewable resources:**
Natural resources and associated problems
Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
  ~ Role of an individual in conservation of natural resources.
  ~ Equitable use of resources for sustainable lifestyles.

### Module III: Ecosystems
Concept of an ecosystem
Structure and function of an ecosystem
Producers, consumers and decomposers
Energy flow in the ecosystem
Ecological succession
Food chains, food webs and ecological pyramids
Introduction, types, characteristic features, structure and function of the following ecosystem:
  a. Forest ecosystem
  b. Grassland ecosystem
  c. Desert ecosystem
  d. Aquatic ecosystems (ponds, streams, lakes, rivers, ocean estuaries)

### Module IV: Biodiversity and its conservation
Introduction – Definition: genetic, species and ecosystem
diversity Biogeographical classification of India
Value of biodiversity: consumptive use, productive use, social, ethical aesthetic and option values
Biodiversity at global, national and local levels
India as a mega-diversity nation
Hot-spots of biodiversity
Threats to biodiversity: habitat loss, poaching of wildlife, man wildlife conflicts
Endangered and endemic species of India
Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity

**Module V: Environmental Pollution**
Definition
    Causes, effects and control measures of:
    a.   Air pollution
    b.   Water pollution
    c.   Soil pollution
    d.   Marine pollution
    e.   Noise pollution
    f.   Thermal pollution
    g.   Nuclear pollution
Solid waste management: Causes, effects and control measures of urban and   industrial wastes.
Role of an individual in prevention of pollution.
Pollution case studies.
Disaster management: floods, earthquake, cyclone and landslides.

**Module VI: Social Issues and the Environment**
From unsustainable to sustainable development
Urban problems and related to energy
Water conservation, rain water harvesting, watershed management
Resettlement and rehabilitation of people; its problems and concerns. Case studies.
Environmental ethics: Issues and possible solutions
Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
Wasteland reclamation
Consumerism and waste products
Environmental Protection Act
Air (Prevention and Control of Pollution) Act
Water (Prevention and control of Pollution) Act
Wildlife Protection Act
Forest Conservation Act
Issues involved in enforcement of environmental legislation
Public awareness

**Module VII: Human Population and the Environment**
Population growth, variation among nations
Population explosion – Family Welfare Programmes
Environment and human health
Human Rights
Value Education
HIV / AIDS
Women and Child Welfare
Role of Information Technology in Environment and Human Health
Case Studies

**Module VIII: Field Work**
Visit to a local area to document environmental assets-river / forest/ grassland/ hill/ mountain.
Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
Study of common plants, insects, birds
Study of simple ecosystems-pond, river, hill slopes, etc (Field work equal to 5 lecture hours)

## Examination Scheme:

| Components | CT | HA | S/V/Q | A | EE |
|---|---|---|---|---|---|
| Weightage (%) | 15 | 5 | 5 | 5 | 70 |

## Text & References:

- Agarwal, K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
- Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380 013, India, Email:mapin@icenet.net (R)

- Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
- Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)
- Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p
- De A.K., Environmental Chemistry, Wiley Eastern Ltd.
- Down to Earth, Centre for Science and Environment (R)
- Gleick, H.P. 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford Univ. Press. 473p
- Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
- Heywood, V.H & Waston, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.
- Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284 p.
- Mckinney, M.L. & School, R.M. 1996. Environmental Science Systems & Solutions, Web enhanced edition. 639p.
- Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
- Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
- Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA, 574p
- Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p.
- Sharma B.K., 2001. Environmental Chemistry. Geol Publ. House, Meerut
- Survey of the Environment, The Hindu (M)
- Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science
- Trivedi R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Standards, Vol I and II, Enviro Media (R)
- Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication (TB)
- Wanger K.D., 1998 Environnemental Management. W.B. Saunders Co. Philadelphia, USA 499p

# COMMUNICATION SKILLS - I

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCS301 | 1 | 0 | 0 | 1 |

## Course Objective:
To form written communication strategies necessary in the workplace

## Course Contents:

**Module I: Introduction to Writing Skills**
Effective Writing Skills
Avoiding Common Errors
Paragraph Writing
Note Taking
Writing Assignments

**Module II: Letter Writing**
Types
Formats

**Module III**
Memo
Agenda and Minutes
Notice and Circulars

**Module IV: Report Writing**
Purpose and Scope of a Report
Fundamental Principles of Report Writing
Project Report Writing
Summer Internship Reports

## Examination Scheme:

| Components | CT1 | CT2 | CAF | V | GD | GP | A |
|---|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 25 | 10 | 10 | 10 | 5 |

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

## Text & References:

- Business Communication, Raman – Prakash, Oxford
- Creative English for Communication, Krishnaswamy N, Macmillan
- Textbook of Business Communication, Ramaswami S, Macmillan
- Working in English, Jones, Cambridge
- A Writer's Workbook Fourth edition, Smoke, Cambridge
- Effective Writing, Withrow, Cambridge
- Writing Skills, Coe/Rycroft/Ernest, Cambridge
- Welcome!, Jones, Cambridge

# BEHAVIOURAL SCIENCE - III

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BSS301 | 1 | 0 | 0 | 1 |

## Course Objective:
This course aims at imparting an understanding of:
Interpersonal communication and relationship.
Strategies for healthy interpersonal relationship
Effective management of emotions.
Building interpersonal competence.

## Course Contents:

**Module I: Interpersonal Communication**
Importance of Behavioural/ Interpersonal Communication
Types – Self and Other Oriented
RapportBuilding – NLP, Communication Mode
Steps to improve Interpersonal Communication

**Module II: Interpersonal Styles**
Transactional Analysis
Life Position/Script Analysis
Games Analysis
Interactional and Transactional Styles
Bridging differences in Interpersonal Relationship through TA
Communication Styles

**Module III: Conflict Management and Negotiation**
Meaning and Nature of conflicts
Styles and techniques of conflict management
Meaning of Negotiation
Process and Strategies of Negotiation
Interpersonal Communication: Conflict Management and Negotiation

**Module IV: Interpersonal Relationship Development**
Importance of Interpersonal Relationships
Interpersonal Relationship Skills
Types of Interpersonal Relationships
Relevance of Interpersonal Communication in Relationship Development

**Module V: Impression Management**
Meaning & Components of Impression Management
Impression Management Techniques
Impression Management Training-Self help and Formal approaches

**Module VI: End-of-Semester Appraisal**
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

## Examination Scheme:

| Components | SAP | A | Mid Term Test (CT) | VIVA | Journal for Success (JOS) |
|---|---|---|---|---|---|
| Weightage (%) | 20 | 05 | 20 | 30 | 25 |

## Text & References:

- Vangelist L. Anita, Mark N. Knapp, Inter Personal Communication and Human Relationships: Third Edition, Allyn and Bacon

- Julia T. Wood. Interpersonal Communication everyday encounter
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.
- Rosenfeld, P., Giacalone, R.A. and Catherine, A.R. (2003). Impression Management: Building and Enhancing Reputations at Work. Thomson Learning, Singapore.

# FRENCH - III

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLF301 | 2 | 0 | 0 | 2 |

## Course Objective:

To provide the students with the know-how
To master the current social communication skills in oral and  in written.
To enrich the formulations, the linguistic tools and vary the sentence construction without repetition.

## Course Contents:

**Module B: pp. 76 – 88 Unité 6**

**Module C: pp. 89 to103 Unité 7**

**Contenu lexical:      Unité 6:se faire plaisir**

   acheter: exprimer ses choix, décrire un objet (forme, dimension, poids et matières)
      payer
   parler de la nourriture, deux façons d"exprimer la quantité, commander un repas
      au restaurant
   3.  parler des différentes occasions de faire la fête

**Unité 7: Cultiverses relations**

   1.   maîtriser les actes de la communication sociale
   courante (Salutations, présentations, invitations,
   remerciements) annoncer un événement, exprimer un
   souhait, remercier, s"excuser par écrit.
   3.  caractériser une personne (aspect physique et caractère)

**Contenu grammatical:**

   1. accord des adjectifs qualificatifs
   2. articles partitifs
   3. Négations avec de, ne…rien/personne/plus
   4. Questions avec combien, quel…
   5. expressions de la quantité
   6. ne…plus/toujours - encore
   7. pronoms compléments directs et indirects
   8. accord du participe passé (auxiliaire « avoir »)
   avec l"objet direct
   9. Impératif avec un pronom complément direct ou indirect
   10. construction avec « que » - Je crois que/ Je pense que/ Je
   saisque

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

 le livre à suivre: Campus: Tome 1

# GERMAN - III

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLG301 | 2 | 0 | 0 | 2 |

## Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

## Course Contents:

### Module I: Modal verbs
Modal verbs with conjugations and usage
Imparting the finer nuances of the language

### Module II: Information about Germany (ongoing)
Information about Germany in the form of presentations or "Referat"– neighbors, states and capitals, important cities and towns and characteristic features of the same, and also a few other topics related to Germany.

### Module III: Dative case
Dative case, comparison with accusative case
Dative case with the relevant articles
Introduction to 3 different kinds of sentences – nominative, accusative and dative

### Module IV: Dative personal pronouns
Nominative, accusative and dative pronouns in comparison

### Module V: Dative prepositions
Dative preposition with their usage both theoretical and figurative use

### Module VI: Dialogues
In the Restaurant,
At the Tourist Information Office,
A telephone conversation

### Module VII: Directions
Names of the directions
Asking and telling the directions with the help of a roadmap

### Module VIII: Conjunctions
To assimilate the knowledge of the conjunctions learnt indirectly so far

Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:
- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

# SPANISH – III

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLS301 | 2 | 0 | 0 | 2 |

## Course Objective:

To enable students acquire knowledge of the Set/definite expressions (idiomatic expressions) in Spanish language and to handle some Spanish situations with ease.

## Course Contents:

**Module I**
Revision of earlier semester modules
Set expressions (idiomatic expressions) with the verb *Tener*, *Poner, Ir….*
Weather

**Module II**
Introduction to *Gustar…*and all its forms. Revision of *Gustar* and usage of it

**Module III**
Translation of Spanish-English; English-Spanish. Practice sentences.
How to ask for directions (using estar)
Introduction to IR + A + INFINITIVE FORM OF A VERB

**Module IV**
Simple conversation with help of texts and vocabulary
En el restaurante
En el instituto
En el aeropuerto

**Module V**
Reflexives

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

- Español, En Directo I A
- Español Sin Fronteras -Nivel Elemental

# CHINESE – III

| Course Code | L | T | P | Credit |
|:---:|:---:|:---:|:---:|:---:|
| FLC301 | 2 | 0 | 0 | 2 |

## Course Objective:

Foreign words are usually imported by translating the concept into Chinese, the emphasis is on the meaning rather than the sound. But the system runs into a problem because the underlying name of personal name is often obscure so they are almost always transcribed according to their pronciation alone. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

## Course Contents:

**Module I**
Drills
Dialogue practice
Observe picture and answer the question.
Introduction of written characters.
Practice reading aloud
Practice using the language both by speaking and by taking notes.
Character writing and stroke order

**Module II**
Measure words
Position words e.g. inside, outside, middle, in front, behind, top, bottom, side, left, right, straight.
Directional words – beibian, xibian, nanbian, dongbian, zhongjian.
Our school and its different building locations.
What game do you like?
Difference between "hii" and "neng", "keyi".

**Module III**
Changing affirmative sentences to negative ones and vice versa
Human body parts.
Not feeling well words e.g.; fever, cold, stomach ache, head ache.
Use of the modal particle "le"
Making a telephone call
Use of "jiu" and "cal" (Grammar portion)
Automobiles e.g. Bus, train, boat, car, bike etc.
Traveling, by train, by airplane, by bus, on the bike, by boat..etc.

**Module IV**
The ordinal number "di"
"Mei" the demonstrative pronoun e.g. meitian, meinian etc.
use of to enter to exit
Structural particle "de" (Compliment of degree).
Going to the Park.
Description about class schedule during a week in school.
Grammar use of "li" and "cong".
Comprehension reading followed by questions.

**Module V**
Persuasion-Please don"t smoke.
Please speak slowly
Praise – This pictorial is very beautiful
Opposites e.g. Clean-Dirty, Little-More, Old-New, Young-Old, Easy-Difficult, Boy-Girl, Black-White, Big-Small, Slow-Fast … etc.
Talking about studies and classmates
Use of "it doesn"t matter"
Enquiring about a student, description about study method.
Grammar: Negation of a sentence with a verbal predicate.

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

- "Elementary Chinese Reader Part I, Part-2" Lesson 21-30

# COMPUTER ORIENTED NUMERICAL METHODS

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA401 | 2 | 1 | 0 | 3 |

## Course Objective:

The objective of this course is to provide conceptual understanding of various numerical methods, in particular, with reference to numerical solution of non linear equations and system of linear equations, interpolation, numerical differentiation and integration and numerical solution of ordinary differential equations. Important theorems and different formulae for various numerical methods to be covered with an aim of helping the students to understand the fundamentals, concepts and practical use of these methods in the field of computer sciences and applications.

## Course Contents:

### Module I: Numeric Computation and Numerical Solutions of Algebraic and Transcendental Equations

Computer Arithmatic- Floating point numbers-operations, Normalization and their Consequences, Absolute, Relative and Percent Error.
**Solution of Algebraic and Transcendental Equations using Iterative Methods-** Zeros of a single Transacendental equations and Zeros of Polynomial Equations using Bisection ,False Position, Newton-Raphson Methods, Convergence of Solution.

### Module II: Solutions of system of Simultaneous Linear Equations
Solution of Simultaneous Linear Equations. Direct Methods:- Gauss elimination method, Pivoting variable, Gauss-Jordan Method. Eigen values and Eigen vectors.
Iterative methods:-Jacobi"s Methods, Gauss-Seidal Method.

### Module III: Polynomial Interpolation
Newtons divided difference, Forward and backward difference Formulae, Difference Tables, Lagrange"s Method.

### Module IV: Numerical Differentiation and Integration
Formula for first and second order derivatives using newton"s- Forward and Backward formula.
Numerical Integration, Newton- Trapizoidal rule, Simpson"s 1/3$^{rd}$ rule ,Simpson"s 3/8$^{th}$ rule, Cotes Formula

### Module V: Numerical Solution of Differential Equations
Basic Terminology of Differential Equations, Picard"s Method, Euler"s method, Taylor"s Series method, Runge-Kutta Methods, Predictor –Connector Method.

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| **Weightage (%)** | 15 | 10 | 5 | 70 |

## Text & References:
*Text:*
- Jain M.K, Jain R.K and Iyenger, Numerical Methods for Scientific and Engineering Applications.

*References:*
- Rajaraman V, Computer Oriented Numerical Methods.
- Krishnamuty, E.V., Sen, S.K, Computer Based Numerical Algorithms.
- Stoer, Bullrich, Computer Oriented Numerical Methods.

# SOFTWARE ENGINEERING

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA402 | 2 | 1 | 0 | 3 |

## Course Objective:

The purpose of this course is to acquaint students with the concepts and methods available for software development in industrial environments. Students will be exposed to a variety of topics such as design notations, costing techniques, and testing methods, as well as to the tools which are available to support software specification, design, testing, and maintenance.

## Course Contents:

**Module I: Software Development Life Cycle**
Evolution of Software Engineering, Software Problems, Issues Involved in Software Engineering, Fundamental Qualities of a Software Product, Approaches to Software Engineering, Planning the development Process, Development/Product Life-Cycle Model, Kinds of Software Life-Cycle Model.

**Module II: Project Management**
Project Management Concepts, Project Management Activities, Size Metrics. Software Requirement analysis and Specification, Cost Models.

**Module III: System Design**
Design Objectives, Design Principles, Effective Modular Design (Functional Independence, Coupling, and Cohesion), Design Tools and Techniques, Prototyping, Structured Programming.

**Module IV: Coding**
Programming Practices, Verification, Monitoring and Control.

**Module V: Software Testing**
Testing Fundamentals, Test case design, Functional Testing, Structural Testing, Test Plan, Activities during testing, Unit System, Integration Testing, Software Maintenance.

**Module VI: Software Reliability**
Concept of Software Reliability, Software Repair and Availability, Software Errors, Failure and Faults.

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- Software Engineering, A Practitioner‟s Approach - Roger S. Pressman.

*References:*
- An Integrated Approach to Software Engineering, PankajJalote.
- Software Engineering Concepts, Richard Fairley.

# COMPUTER GRAPHICS

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA403 | 2 | 1 | 0 | 3 |

## Course Objective:

The objective of this course is to present the basic principles for the design, use and understanding of computer graphics systems. Both hardware and software components of graphics systems are discussed here. This course also teaches the students about different algorithms for creating and manipulating graphics displays. Varieties of mathematical methods are used in various computer graphics algorithm.

## Course Contents:

**Module I: Introduction of Graphics**
Development of Computer Graphics, Basic Graphics System and Standards.
**Graphics Devices:**
Raster and Random Scan Devices, Continual Refresh and Storage Displays, Display Processor, Color Display Techniques, Frame Buffer, Concepts in Raster Graphics.

**Module II: Graphics Primitives**
Points, Pixels, Scan Conversion, Line Drawing Algorithms, Circle Drawing Algorithms, Anti-aliasing Technique, Character generator
**Polygon**
Polygon representation, Polygon Filling, Inside/Outside Testing

**Module III: Transformation**
Scaling, Translation, Rotation, Coordinate Axis Rotation, Reflection, Shears, Composite Transformation, Modeling and Coordinate Transformation
**Viewing:** Two – Dimensional Viewing, Viewing transformation, Interactive Picture Construction Techniques, Interactive Input/Output Devices,

**Module IV: Segment**
Segment Table, Creating Deleting and Renaming a Segment, Visibility and Image
Transformation **Windowing and Clipping:** Window, View-port, Line clipping, polygon clipping, Multiple Windowing

**Module V: Three Dimensional Concepts**
3-D Representation and Transformation, 3-D Viewing, Algorithm for 3-D Volumes, Introduction to Spline Curves and Surfaces

Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| **Weightage (%)** | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- ☙ Computer Graphics By Donald Hearn And Pauline Baker
- ☙ Harrington"s "Computer Graphics " A Programming Approach

*References:*
- ☙ Principle of Interactive Computer Graphics By New, W. M. And Spraull
- ☙ Foley "Computer Graphics" Addission Wesley
- ☙ Rogers" "Procedural Elements Of Computer Graphics " Mc-Grawhilll

# DESIGN AND ANALYSIS OF ALGORITHMS

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA404 | 2 | 1 | 0 | 3 |

## Course Objective:

The objective of the course is to provide the fundamentals and the concepts of Design & analysis of Algorithms including Mathematical foundations, Sorting & Order Statistics, Data Structures, Advanced Design & Analysis techniques such as Divide & Conquer, greedy method & Dynamic Programming approaches.

## Course Contents:

**Module I: Introduction**
Algorithms, Analyzing algorithms, Designing algorithms.
**Mathematical Foundations:** Growth of Functions-Asymptotic natation, Recurrence
The substitution Method, Recursion tree method, Master Method.

**Module II: Sorting and Order statistics**
Divide & Conquer Strategy, Heap Sort, Quick Sort, V. stressen Matrix Multiplication, Sorting in Linear time.
**Data Structures**: Elementary data structures, hash tables, Binary search trees.

**Module III:Advanced Design and Analysis Techniques**
Dynamic programming- Elements of
dynamic programming, Chain-matrix multiplication, All pair shortest path (Flayed -
algorithm), Optimal Binary Search. Tree.
**Greedy algorlthms**- Elements of the greedy strategy, Huffman codes, SIngle-source shortest path in a directed graph, Knapsack problem, MinimunSpmming trees- The Algorithm of Kruskals and Prims.

**Module IV: Graph Algorithms**
Elementary graphs Algorithms, Minimum spanning Trees, Single source Shortest paths, All Pair Shortest Paths.
**Selected Topics**: Sorting Networks, Algorithms for Parallel Computers.

**Module V**
Polynomials and tile FFT, String Matching, NP-Completeness, Approximation Algorithms.

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:
*Text:*
- Coreman, Rivest, Lisserson, "Algorithms", PHI

*References:*
- Horowitz &Sahni," Fundamental of Computer Algorithm", Galgotia. Aho, Hopcropt, Ullman,
- Data Structure &Algoritlull", Addision Wesley.

# OPERATING SYSTEMS

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA405 | 2 | 1 | 0 | 3 |

## Course Objective:
The objective of this course is to provide a clear description of the concepts that underlie operating systems. It tells about fundamental concepts that are applicable to a variety of systems. We present a large number of examples that pertains particularly to UNIX and to other popular operating systems. This course basically revolves around process, and it tells about every thing about a process.

## Course Contents:

**Module I: Operating System as a Resource Manager**
Operating System Classifications
Monitor, Multiprogramming, Time Sharing, Real Time Systems,
Multiprocessor Systems and Operating System Services.

**Module II: CPU Scheduling**
Basic Scheduling Concepts, Process Overviews, Process States, Multiprogramming,
Scheduler and Scheduling Algorithms, Multiple Processor Scheduling

**Module III: Memory Management**
Bare Machine, Resident Monitor, Partition, Paging and Segmentation, Virtual Memory and Demand Paging, Replacement Policies, Cache Memory

**Module IV: File Systems**
File Support, Access Methods
Allocation Methods- Contiguous Linked and Index Allocation
**Directory Systems**
Single Level, Tree Structured, Acyclic Graph and General Graph Directory, File Protection
**Deadlock**
Deadlock Characterization, Deadlock Prevention, Deadlock Avoidance and Deadlock Recovery

**Module V: Security and Protection**
Security Policies and Mechanism
Protection and Access Control-Access Matrix Model of Protection, Access Hierarchies, Access List, Capabilities
**Overview of Unix Operating System**
Command-Language User"s View of Unix, Implementation of Unix, Unix Summary Etc.

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd. | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- Peterson And Silberschatz, Operating System Concepts

*References:*
- Tannenbaum A.S., Modern Operating System
- CrowlyCharrles, Operating System- A design Approach
- Dietel H.M., Operating Systems

# COMPUTER GRAPHICS LAB

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA420 | 0 | 0 | 2 | 1 |

## List of Computer Graphics Programmes

1) Write a program to change the working mode from text to graphics and plot a pixel.
2) Write a program to draw a line of same dimension in three different graphics mode.
3) Write a program to display line, rectangle, circle and polyline using graphics command.
4) Write a program to draw a line of slope between 0 and 1 using DDA algorithm.
5) Write a program to draw a line of slope between 1 and $\infty$ using DDA algorithm.
6) Write a program to draw a line of slope between 0 and 1 using midpoint algorithm.
7) Write a program to draw a line of slope between 1 and $\infty$ using midpoint algorithm
8) Write a program to draw a dashed line of slope 1 using any line algorithm
9) Write a program to draw a dotted line of slope 1 using DDA algorithm
10) Write a program to draw a line of slope between 0 and -1 using midpoint algorithm.
11) Write a program to draw a line of slope between -1 and -$\infty$ using midpoint algorithm.
12) Write a program to draw an octant of a circle with it"s center at point (0,0) a using midpoint circle drawing.
13) Write a program to draw a circle with its center at point (0, 0) and radius r using midpoint circle drawing.
14) Write a program to draw an octant of a circle with it"s center at point (a, b) and radius r using midpoint circle drawing.
15) Write a program to a circle with it"s center at point (a, b) and radius r using midpoint circle drawing.
16) Write a program to fill a polygon using flood-fill method.
17) Write a program to fill a polygon using boundary-fill method.
18) Write a program to reflect a point in X and Y-axis both.
19) Write a program to rotate a point (100, 50) about origin in anti-clock wise direction.
20) Write a program to rotate a point (100,150) about point (30, 40) in clock wise direction..

## Examination Scheme:

| IA | | | | EE | |
|---|---|---|---|---|---|
| A | PR | LR | V | PR | V |
| 5 | 10 | 10 | 5 | 35 | 35 |

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# INTRODUCING ROUTING AND SWITCHING IN THE ENTERPRISE

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA430 | 2 | 1 | 0 | 3 |

**Course Objective:**
This course focuses networking in enterprise network, switching in enterprise network, addressing in enterprise network, routing & distance vector and link state protocol, and Trouble shooting an enterprise network.

**Course Contents:**

**Module I: Networking in the Enterprise**
Describing the Enterprise Network, Identifying Enterprise Applications

**Module II: Exploring the Enterprise Network Infrastructure**
Describing the Current Network, Supporting the Enterprise Edge, Reviewing Cisco Routing and Switching

**Module III: Switching in an Enterprise Network**
Describing Enterprise Level Switching, Preventing Switching Loops, Configuring VLANs, Trunking and Inter - VLAN Routing, Maintaining VLANs on an Enterprise Network

**Module IV: Addressing in an Enterprise Network**
Using a Hierarchical IP Network Address Scheme, Using VLSM, Using Classless Routing and CIDR, Using NAT and PAT

**Module V: Routing with a Distance Vector Protocol**
Managing Enterprise Networks, Routing Using the RIP Protocol, Routing Using the EIGRP Protocol, Implementing EIGRP

**Module VI: Routing with a Link-State Protocol**
Routing Using the OSPF Protocol, Implementing Single-Area OSPF, Using Multiple Routing Protocols

**Module VII: Implementing Enterprise WAN Links**
Connecting the Enterprise WAN, Comparing Common WAN Encapsulations
Using Frame Relay

**Module VIII: Filtering Traffic Using Access Control Lists**
Using Access Control Lists, Using a Wildcard Mask, Configuring Access Control Lists, Permitting and Denying Specific Types of Traffic, Filtering Traffic Using Access Control Lists

**Module IX: Troubleshooting an Enterprise Network**
Understanding the Impact of Network Failure, Troubleshooting Switching and Connectivity Issues, Troubleshooting Routing Issues, Troubleshooting WAN Configurations, Troubleshooting Access Control List Issues

**Examination Scheme:**

| Components | CT1 | A/C/Q | ATTD. | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

**Text & References:**

*Text:*
- CCNA-Discovery 4.0, module 3, Cisco Certified Networking Academy

*References:*
- Data Communication and Computer Network, Forozoun, TMH Publication
- Data Communication and Network, Stallings, PHI
- Computer Network, Tanenbaum, PHI

# INTRODUCTION TO OPEN SOURCE TECHNOLOGIES
## (PHP, MySql)

| Course Code | L | T | P | Credit |
|:---:|:---:|:---:|:---:|:---:|
| BCA431 | 2 | 1 | 0 | 3 |

**Course Objective:**

This course is aimed to provide a fundamental understanding of dynamic web site creation. PHP is the language used for development of most common web sites. Syllabus includes basic and advanced features of PHP which includes detailed introduction of PHP and MYSQL, Arrays, Loops and variables etc. It also gives an overview open source framework like JOOMLA, ZEND etc...

## Course Contents:
**Module I: Introduction to PHP programming**
Introduction to PHP, installation and configuration, Variables, String functions, Numeric functions

**Module II: Operator, Loops and Array**
Operators, Conditions, Loops, Array, Multidimensional Array, Associative array

**Module III: Classes and Functions**
Classes, Regular Expr, Working with Datetime, code re-use, require (), include(), and the include_path; filesystem functions, and file input and output; file uploads; error handling and logging; sending mail,

**Module IV: Working with database**
MYSQL, Introducing MySQL; database design concepts; the Structured Query, Language (SQL); communicating with a MySQL backend via the PHP, MySQL APIBuilding Database Applications,

**Module V: Working with Frameworks**
Working with Wordpress, Mambo, Joomla, OS Commerce, Zend Framework, Drupal

**Examination Scheme:**

| Components | CT1 | A/C/Q | ATTD. | EE |
|:---|:---:|:---:|:---:|:---:|
| Weightage (%) | 15 | 10 | 5 | 70 |

**Text & References:**

*Text:*
- Beginning PHP, Apache, MySQL Web Development
- Michael K. Glass, Yann Le Scouarnec, Elizabeth Naramore, Gary Mailer, Jeremy Stolz, Jason Gerner

*References:*
- PHP Manual.

# PROGRAMMING IN VISUAL BASIC

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA432 | 2 | 1 | 0 | 3 |

**Course Objective:**

This course is aimed to provide a fundamental understanding of Visual Programing Environment for the students in their early stages of academic career. Various concepts regarding GUI such as Manipulating GUI Tools like Command Buttons, Checkboxes, Combo boxes, etc. through Programming in a Visual Environment will be introduced for students to develop a Healthy Programming attitude towards new and emerging Technologies in the field of Visual Programming. After this course, you will be able to understand fundamental concepts of Visual Programming and development of various GUI applications.

**Course Contents:**

**Module I: Introduction to Visual Basic**

Introduction, CUI, GUI, Why Visual Programming, Different Visual Programming Languages, Initial Screens, Different applications, Starting a new project, MDI and SDI, Variables and constants, Data Types, Scope of variables, Operators, Forms, Basic Controls (Text box, Labels, Command buttons, Image Control, Picture box), Properties, Methods and Events, Message Box, Input Box

**Module II: Controlling Program Flow**

Determinate and Indeterminate Loops, Making Decisions, Select Case, Nested If-Then, Go to.

**Module III: Some More Controls**

Option Button, Check Boxes, List and Combo and Boxes, Timers, Scroll bars.

**Module IV: Arrays, Function and Procedure**

Arrays, Control arrays, Sub procedure, Functions, Built in functions.

**Module V: Menus and dialog boxes**

Menus, Toolbars, Image list control, Status bar control.

**Module VI: Additional Controls**

File List Box, Directory List Box, Drive List Box.

**Module VII: File Handling**

File Commands, Sequential Files, Random Access Files, Binary Files.

**Module VIII: Introduction to Database handling**

Introduction, Database access methods, DAO, ADO, RDO, Database handing through ADO, SQL.

**Examination Scheme:**

| Components | CT1 | A/C/Q | ATTD. | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

**Text & References:**

- Petroutsos, Evangelos. *Mastering Microsoft Visual Basic 2010*. John Wiley & Sons, 2010.
- Sheldon, B., Hollis, B., Sharkey, K., Marbutt, J., Windsor, R., & Hillar, G. C. (2010). *Professional visual basic 2010 and. net 4*. John Wiley & Sons.

## Reference Books:

- Randolph, N., Gardner, D., Anderson, C., & Minutillo, M. (2010). *Professional visual studio 2010*. John Wiley & Sons.

# INTRODUCING ROUTING AND SWITCHING IN THE ENTERPRISE LAB

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA421 | 0 | 0 | 2 | 1 |

**Course Contents:**
1. Application of Cisco Router and Switches in Enterprise Network with example design.
2. Enterprise level Switching techniques.
3. Creating LAN with swich and preventing loops with example.
4. Creating ,Managing and deleting different VLAN.
5. Creating Trunking and Intr-VLAN Routing.
6. Use of VLSM and CIDR for Hierarchical IP Network Address Scheme with some example scenario.
7. Configuration of NAT and PAT in router.
8. Configuring router with RIP Protocol.
9. Configuring router with EIGRP Protocol.
10. Configuration of ACL in router and use of Wildcard Mask.
11. Configuring router as gateway for traffic filtering with example scenario.
12. Troubleshooting Switching, Routing, WAN and ACL issues.

**Examination Scheme:**

| IA | | | | EE | |
|---|---|---|---|---|---|
| A | PR | LR | V | PR | V |
| 5 | 10 | 10 | 5 | 35 | 35 |

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# INTRODUCTION TO OPEN SOURCE TECHNOLOGIES
## (PHP, MySql) LAB

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA422 | 0 | 0 | 2 | 1 |

**Course Contents:**

1. Write the process of installation of web server.

2. Write programs to print all details of your php sever. Use phpinfo().

3. Write a program to give demo of ECHO and PRINT command.

4. Write a program sort ten number by using array.

5. Create a database in MySql and connect that database from PHP.

6. Write a program to Update, insert and delete the values of table in Question No – 9 database.

**Examination Scheme:**

| IA | | | | EE | |
|---|---|---|---|---|---|
| A | PR | LR | V | PR | V |
| 5 | 10 | 10 | 5 | 35 | 35 |

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# PROGRAMMING IN VISUAL BASIC LAB

| Course Code | L | T | P | Credit |
|:---:|:---:|:---:|:---:|:---:|
| BCA423 | 0 | 0 | 2 | 1 |

**Course Contents:**

1. Write a program to calculate simple interest.
2. Write a program to calculate factorial of a given number.
3. Create a project for book sales. Make text boxes for quantity, title and price with labels. Calculate total price, discount (15%) and discounted price. Make command buttons for calculate, clear and exit.
4. Create a project for the local car rental agency that calculates rental charges. The agency charge $15 per day + $0.50 per km. use text boxes for customer name, address, city, state, zip code, beginning and ending audiometer reading and no. of days the car was used. Use labels to display the miles given and the total charges. Make command buttons for clear, exit and calculate.
5. Create a project that will input an employee salary. Calculate a gross salary, deduction and net salary. Each employee will receive a basic pay of $900 + sales commission of 6% of sales. After calculating the net paid calculate the budget amount of each category based on the % given.

   Bank pays          $900
   Commission          6% of sales
   Gross pay          Basic pay + Commission
   Deduction          18% of gross pay
   Net pay            Gross pay - deduction

   Budeget:-
   Housing            30% of net pay
   Food and clothing  15% of net pay
   Entertainment      50% of net pay
   Miscellaneous       5% of net pay

Use text boxes to input the employee name, amount of sales. Use labels to display the result and the calculation. Use calculates, clear and exit command buttons.

6. Write a program to create login form.
7. Create a project that contains a form for entering book information from controls.
   - Text boxes for author and title.
   - Option button for type fiction or non-fiction.
   - Dropdown list for subject that will include bestseller, fantasy, religion, romance, humor, science fiction, business, philosophy, education, self-help and mystery.
   - List box for shelf no. containing RC-111, RC-112, RC-113, and RC-114.
   - Use command buttons display, clear and exit.
   - Use labels to display information.
8. Create a list box, which contains names of all cinema halls of NCR. If you choose name of cinema hall, label display information regarding all movies running in the cinema halls.
9. Create a project that contains student"s information
   - Text boxes to display name and courses.
   - Option buttons for semester/ year.
   - Use list boxes for computers, business, humanities, Commerce, medical and engineering.
   - A simple combo for name of college.
   - Display information on a label.
   - Make command buttons for display, clear and exit.

10. Write a program to check whether the number is even or odd.
11. Write a program, using recursive function to calculate Nth Fibonacci number.
12. Write a program, using recursive function to generate Fibonacci Series.
13. Write a program, using recursive function to calculate Power of a number.
14. Write a program, using recursive function to calculate GCD of a number.
15. Write a program, using recursive function for Tower of Hanoi, showing all the steps in a list box.
16. Write a program to division of two numbers. Also shows divide by zero error.

17. Write a program, to check whether a given number is prime number or not.
18. Write a program to generate first 10 prime numbers.
19. Write a program, to check whether a given string is palindrome or not.
20. Write a program to enter elements of an array in list box and update them by incrementing or decrementing them by 10 and store the results in other list.
21. Write a program to search an element in an array, using Linear Search.
22. Write a program to search an element in an array, using Binary Search.
23. Write a program to find out the no. of character, words and blank spaces in the given string.
24. Write a program to concatenate two strings.
25. Write a program to check whether the given string is in upper case or lower case and also convert it"s case.
26. Write a program to calculate the sum of the digits of a given no. and also reverse the no.
27. Write a program to create a Pop Up Menu.
28. Design a project that has multiple forms, such that form1 is welcome form, form2 Contains personal details and from3 contains professional information and form4 display both personal as well as professional information of a employee.
29. Design a project for a MDI application, such that child1 contains no menu and child2 contains menu. With this demonstrate working of an MDI form.
30. Create a project that maintains a Publisher table in a Library database, having fields" pub id, name, company name, address, city, telephone. Allow Adds and Deletes to the database. Include command buttons for navigation.

**Examination Scheme:**

| IA | | | | EE | |
|---|---|---|---|---|---|
| **A** | **PR** | **LR** | **V** | **PR** | **V** |
| 5 | 10 | 10 | 5 | 35 | 35 |

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# COMMUNICATION SKILLS - II

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCS401 | 1 | 0 | 0 | 1 |

## Course Objective:
To teach the participants strategies for improving academic reading and writing.
Emphasis is placed on increasing fluency, deepening vocabulary, and refining academic language proficiency.

## Course Contents:

### Module I: Social Communication Skills
Small Talk
Conversational English
Appropriateness
Building rapport

### Module II: Context Based Speaking
In general situations
In specific professional situations
Discussion and associated vocabulary
Simulations/Role Play

### Module III: Professional Skills
Presentations
Negotiations
Meetings
Telephony Skills

## Examination Scheme:

| Components | CT1 | CT2 | CAF | V | GD | GP | A |
|---|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 25 | 10 | 10 | 10 | 5 |

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

## Text & References:

- Essential Telephoning in English, Garside/Garside, Cambridge
- Working in English, Jones, Cambridge
- Business Communication, Raman –Prakash, Oxford
- Speaking Personally, Porter-Ladousse, Cambridge
- Speaking Effectively, Jermy Comfort, et.al, Cambridge
- Business Communication, Raman –Prakash, Oxford

# BEHAVIOURAL SCIENCE - IV

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BSS401 | 1 | 0 | 0 | 1 |

## Course Objective:
To inculcate an elementary level of understanding of group/team functions To
develop team-spirit and to know the importance of working in teams

## Course Contents:

**Module I: Group formation**
Definition and Characteristics
Importance of groups
Classification of groups
Stages of group formation
Benefits of group formation

**Module II: Group Functions**
External Conditions affecting group functioning: Authority, Structure, Org. Resources, Organizational policies etc.
Internal conditions affecting group functioning: Roles, Norms, Conformity, Status, Cohesiveness, Size, Inter group conflict.
Group Cohesiveness and Group Conflict
Adjustment in Groups

**Module III: Teams**
Meaning and nature of teams
External and internal factors effecting team
Building Effective Teams
Consensus Building
Collaboration

**Module IV: Leadership**
Meaning, Nature and Functions
Self leadership
Leadership styles in organization
Leadership in Teams

**Module V: Power to empower: Individual and Teams**
Meaning and Nature
Types of power
Relevance in organization and Society

**Module VI: End-of-Semester Appraisal**
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Examination Scheme:

| Components | SAP | A | Mid Term Test (CT) | VIVA | Journal for Success (JOS) |
|---|---|---|---|---|---|
| **Weightage (%)** | 20 | 05 | 20 | 30 | 25 |

## Text & References:
- Organizational Behaviour, Davis, K.
- Hoover, Judhith D. Effective Small Group and Team Communication, 2002,Harcourt College Publishers
- Dick, McCann&Margerison, Charles: Team Management, 1992 Edition, viva books
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
    - Smither Robert D.; The Psychology of Work and Human Performance, 1994, Harper Collins College

# FRENCH - V

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLF401 | 2 | 0 | 0 | 2 |

## Course Objective:

To enable students:

- To develop strategies of comprehension of texts of different origin
- To present facts, projects, plans with precision

## Course Contents:

**Module C:  pp. 104 – 139: Unités 8,9**

**Contenu lexical:Unité 8: Découvrir le passé**

1. parler du passé, des habitudes et des changements.
2. parler de la famille, raconter une suite d"événements/préciser leur date et leur durée.
3. connaîtrequelques moments de l"histoire

**Unité 9: Entreprendre**

1. faire un projet de la réalisation: (exprimer un besoin, préciser les étapes d"une réalisation)
2. parlerd"uneentreprise
3. parler du futur

**Contenu grammatical:**

1. Imparfait
2. Pronom « en »
3. Futur
4. Discoursrapporté au présent
5. Passé récent
6. Présentprogressif

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

- le livre à suivre: Campus: Tome 1

# GERMAN - IV

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLG401 | 2 | 0 | 0 | 2 |

## Course Objective:

To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.

To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany.

Introduction to Advanced Grammar Language and Professional Jargon

## Course Contents:

### Module I: Present perfect tense
Present perfect tense, usage and applicability
Usage of this tense to indicate near past
Universal applicability of this tense in German

### Module II: Letter writing
To acquaint the students with the form of writing informal letters.
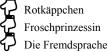
### Module III: Interchanging prepositions
Usage of prepositions with both accusative and dative cases
Usage of verbs fixed with prepositions
Emphasizing on the action and position factor

### Module IV: Past tense
Introduction to simple past tense
Learning the verb forms in past tense
Making a list of all verbs in the past tense and the participle forms

### Module V: Reading a Fairy Tale
Comprehension and narration
- Rotkäppchen
- Froschprinzessin
- Die Fremdsprache

### Module VI: Genitive case
Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

### Module VII: Genitive prepositions
Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

### Module VIII: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture; Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation, I – Interaction/Conversation Practice

## Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch

- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

# SPANISH - IV

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLS401 | 2 | 0 | 0 | 2 |

## Course Objective:
To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations with ease.

## Course Contents:

**Module I**
Revision of earlier semester modules
Introduction to Present Continuous Tense (Gerunds)

**Module II**
Translation with Present Continuous Tense
Introduction to Gustar, Parecer, Apetecer, doler

**Module III**
Imperatives (positive and negative commands of regular verbs)

**Module IV**
Commercial/business vocabulary

**Module V**
Simple conversation with help of texts and vocabulary
En la recepciondelhotel
En el restaurante
En la agencia de viajes
En la tienda/supermercado

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

- Español Sin Fronteras (Nivel – Elemental)

# CHINESE – IV

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLC401 | 2 | 0 | 0 | 2 |

## Course Objective:

How many characters are there? The early Qing dynasty dictionary included nearly 50,000 characters the vast majority of which were rare accumulated characters over the centuries. An educate person in China can probably recognize around 6000 characters. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

## Course Contents:

**Module I**
Dialogue Practice
Observe picture and answer the question
Pronunciation and intonation
Character writing and stroke order.
Electronic items

**Module II**
Traveling – The Scenery is very beautiful
Weather and climate
Grammar question with – "bushi …. Ma?"
The construction "yao … le" (Used to indicate that an action is going to take place)
Time words "yiqian", "yiwai" (Before and after).
The adverb "geng".

**Module III**
Going to a friend house for a visit meeting his family and talking about their customs.
Fallen sick and going to the Doctor, the doctor examines, takes temperature and writes prescription.
Aspect particle "guo" shows that an action has happened some time in the past.
Progressive aspect of an actin "zhengzai" Also the use if "zhe" with it.
To welcome someone and to see off someone …. I cant go the airport to see you off… etc.

**Module IV**
Shipment. Is this the place to checking luggage?
Basic dialogue on – Where do u work?
Basic dialogue on – This is my address
Basic dialogue on – I understand Chinese
Basic dialogue on – What job do u do?
Basic dialogue on – What time is it now?

**Module V**
Basic dialogue on – What day (date) is it today?
Basic dialogue on – What is the weather like here.
Basic dialogue on – Do u like Chinese food?
Basic dialogue on – I am planning to go to China.

Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

## Text & References:
🎬 "Elementary Chinese Reader, Part-2" Lesson 31-38

# JAVA PROGRAMMING

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA501 | 2 | 1 | 0 | 3 |

## Course Objective:
The objective of the course is to give proficiency in developing applications and applets in Java, in-depth knowledge of object oriented concepts, developing GUI applications in Java, creation of packages, Event Handling, Layout Manager, SWING and String handling in Java

## Course Contents:

### Module I: Introduction
Concepts of OOP, Features of Java, How Java is different from C++, Data types, Control Statements, identifiers, arrays, operators. Variables, Applications and Applets

### Module II: Java Programming
Classes and methods,Constructor ,Types of constructor, method overloading
Inheritance: Single Inheritance , Multilevel hierarchy, method overriding, Abstract classes, Interface, Final classes, Garbage Collection, String classess

### Module III: AWT and Event Handling
Introduction to AWT, Layout Manager, Event handling Mechanism, Event Model, Event Classes, Sources of Events, Event Listener Interfaces
AWT: Working with Windows, AWT Controls
Html basic tags, Applet Classes, Graphics,

### Module IV: Exception Handling and Multithreading
Exception handling, fundamentals exception types, uncaught exceptions, throws, throw, try and catch, final, built in exception, creating your own exception
Multithreading fundaments, Creating, Implementing and Extending thread, thread priorities, synchronization suspending, resuming and stopping Threads

### Module V: Java Packages
Package creation, Additional Packages, Input Output Exploring java.io, Swing classes and controls, Advantages of Swing over AWT.

## Examination Scheme:

| Components | CT1 | PR. | ATTD. | EE |
|---|---|---|---|---|
| Weightage (%) | 10 | 15 | 5 | 70 |

## Text & References:

*Text:*
- Naughton, Schidt "The Complete Reference JAVA 2 " TMH

*References:*
- Balaguruswamy "Programming in JAVA"
- Comer "Computer Networks & Internet"
- Deitel&Deitel "Java™ How to Program, 6/E**"**
- Frouzan "Data communications and Networking"
- Gary Cornell "Core Java" The Sun Micro Systems Series

# SYSTEMS SOFTWARE

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA502 | 2 | 1 | 0 | 3 |

## Course Objective:

The objective of this course is to expose the student to the fundamentals of System Software. The topics include design and implementation of various system software"s such as assembler, compiler, macro processors, Loaders, Linkers and operating systems. Also included is brief overview of software program development tools like editors, debug monitors and database management systems.

## Course Contents:

### Module I

System Software and Machine Architecture, Evolution of the components of a programming System-Assemblers, Loaders, Macros, Compilers and Formal Systems.
Assemblers-basic assembler functions, Machine-Dependent Assembler Functions, Machine-Independent Assembler Functions, Design of Two Pass Assembler. Implementation Examples-SPARC.

### Module II

Macros & Macro Processors-Macro Instructions, Macro calls and Expansion, Machine-Independent Macro Processor Features, Macro Processor Design Options, Implementation-A two pass algorithm, Implementation Examples-ANSI C Macro Processor

### Module III

Loaders & Linkers, Basic Loader Functions, Machine-Dependent Loader Features, Machine-Independent Loader Features, Compile & Go-Loaders, General Loader Scheme, Absolute Loaders, Self- Relocating Loaders, Direct-Linking Loaders, Binders, Overlays, Dynamic Linking, Bootstrap Loaders, Design of Direct Linking Loader, Implementation Examples-MS-DOS Linker.

### Module IV

Compilers, Basic Compiler Functions, Machine-Dependent Compiler Features, Machine-Independent Features, Compiler Design Options-Division into passes, Interpreters, P-code Compilers, Compilers-Compilers, Implementation Example-YACC Compiler-Compiler.

### Module V

Basic Operating System Functions, Machine-Dependent Operating System Features, Machine-Independent Operating System Features, Types of Operating System, Implementation Example-Unix.
Software Tools for Program Development, Editors, Debug Monitors, User Interfaces, and Database Management Systems-basic concepts, levels of data description, use of DBMS.

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 10 | 15 | 5 | 70 |

## Text & References:

*Text*:
- Leland L. Beck, System Software-An Introduction to Systems Programming, Addison Wesley.

*References:*
- D.M. Dhamdhere,, Systems Programming & Operating Systems, McGraw Hill
- John J. Donovan, Systems Programming, McGraw Hill.

# UNIX OPERATING SYSTEM & SHELL PROGRAMMING

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA503 | 2 | 1 | 0 | 3 |

## Course Objective:
The Objective of this course is to expose the students to the fundamentals and the concepts of Unix and Shell Programming including UNIX Overview, Essential Unix Commands, Unix File System, UNIX Shell Programming and System Administration etc. This course is designed to understand the concepts of Unix System for Research and Development.

## Course Contents:

**Module I: Overview**
UNIX Overview, UNIX System Organization, Kernel , Running a Command: the Shell, Files and Directories, Peripheral Devices and UNIX: Special Files.

**Module II: UNIX Commands & UNIX Editors**
Login, password, hostname; creating an account; Virtual consoles; shell and commands; logout; changing password; Files and Directories; pathname; Directory Tree; current working directory; relative pathname; referring to home directories; Commands to move around; creating new directories; copying files; moving files; Deleting files and directories; looking at files: cat, more; Getting online help; manual pages. Wildcards; hidden files; Standard input and output; redirecting input and output; filter; pipes; file permissions; user and group; Interpreting file permissions; Permission Dependencies; Changing permissions. Managing file links; hard links; symbolic links; jobs and process: process ID; Job control; foreground and background jobs; suspend and interrupt a process; Back grounding and killing jobs; stopping and restarting jobs.

**Vi Editor**
Command mode, insert mode and last line mode; command to delete character, insert line; deleting text, command for moving the cursor; including other files; running shell commands; getting vi help; search and replace commands; changing and deleting text, Change word, Change line, Delete current line, Delete n lines, Delete remainder of Lines; copying and moving; Saving and Exiting.

**Module III: File System**
UNIX File System, File Permissions, System Calls and Library Functions

**Module IV: UNIX Shell Programming**
Interactive Shell Scripts, Shell Variables and Keywords, Positional Parameters and Command Line Arguments, Arithmetic in Shell Scripts, Taking Decisions, Loop Control Structure, Shell Metacharacters

**Module V: System Administration**
Adding and Removing Users, Starting up and Shutting down the System, Disk Management, File System Mounting and Unmounting, Monitoring System Usage, Ensuring System Security

Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 10 | 15 | 5 | 70 |

## Text & References:
*Text*:
- Maurice J. Bach, "Design of the Unix operating System" PHI.
- Prata. "Advanced UNIX-A Programmers Guide" BPB
- Kanetkar. "UNIX Shell Programming" BPB

*References:*
- Sumitabha Das, "UNIX: Concepts and Application", TMH.

# SUMMER PROJECT – II (EVALUATION)

| Course Code | L | T | P | Credit |
|:---:|:---:|:---:|:---:|:---:|
| BCA560 | 0 | 0 | 0 | 6 |

## Guidelines:

There are certain phases of every Intern"s professional development that cannot be effectively taught in the academic environment. These facets can only be learned through direct, on-the-job experience working with successful professionals and experts in the field. The internship program can best be described as an attempt to institutionalize efforts to bridge the gap between the professional world and the academic institutions. Entire effort in internship is in terms of extending the program of education and evaluation beyond the classroom of a university or institution. The educational process in the internship course seeks out and focuses attention on many latent attributes, which do not surface in the normal classroom situations. These attributes are intellectual ability, professional judgment and decision-making ability, inter-disciplinary approach, skills for data handling, ability in written and oral presentation, sense of responsibility etc.

In order to achieve these objectives, each student will maintain a file (**Internship File**). The Internship File aims to encourage students to keep a personal record of their learning and achievement throughout the Programme. It can be used as the basis for lifelong learning and for job applications. Items can be drawn from activities completed in the course modules and from the workplace to demonstrate learning and personal development.

The File will assess the student"s analytical skills and ability to present supportive evidence, whilst demonstrating understanding of their organization, its needs and their own personal contribution to the organization.

The **layout guidelines** for the Project & Seminar Report:

**1. File should be in the following**
**specification:** A4 size paper
Font: Arial (10 points) or Times New Roman (12 points)
Line spacing: 1.5
Top & bottom margins: 1 inch/ 2.5 cm
Left & right margins: 1.25 inches/ 3 cm

**2. Report Layout:** The report should contain the following
components: Front Page
Table of Content
Acknowledgement Student
Certificate Company
Profile (optional)
Introduction
Main Body
References / Bibliography

The File will include *five sections* in the order described below. The content and comprehensiveness of the main body and appendices of the report should include the following:

1. **The Title Page**--Title - An Internship Experience Report For (Your Name), name of internship organization, name of the Supervisor/Guide and his/her designation, date started and completed, and number of credits for which the report is submitted.
2. **Table of Content**--an outline of the contents by topics and subtopics with the page number and location of each section.
3. **Introduction**--short, but should include how and why you obtained the internship experience position and the relationship it has to your professional and career goals.
4. **Main Body**--should include but not be limited to daily tasks performed. Major projects contributed to, dates, hours on task, observations and feelings, meetings attended and their purposes, listing of tools and materials and their suppliers, and photographs if possible of projects, buildings and co-workers.
5. **References / Bibliography** --This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system

**ASSESSMENT OF THE INTERNSHIP FILE**

The student will be provided with the Student Assessment Record (SAR) to be placed in front of the Internship File. Each item in the SAR is ticked off when it is completed successfully. The faculty will also assess each item as it is completed. The SAR will be signed by the student and by the faculty to indicate that the File is the student"s own work. It will also ensure regularity and meeting the delaines.

**STUDENT ASSESSMENT RECORD (SAR)**

**5.   Range of Research Methods used to obtain information**

**6.   Execution of Research**

**7.   Data Analysis**
- Analyse Quantitative/ Qualitative information
- Control Quality

**8.   Draw Conclusions**

**Examination Scheme:**

| Components | V | S | R | FP |
|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 40 |

V – Viva, S – Synopsis, FP – Final Presentation, R - Report

# JAVA PROGRAMMING LAB

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA520 | 0 | 0 | 2 | 1 |

**List of Programme**

1. Create a "Hello, World" program that simply prints out that statement.
2. Write a program that prints three arguments taken from the command line.
3. Write a program that prints values from 1 to 100.
4. Create a class with a default constructor (one that takes no arguments) that prints a message. Create an object of this class.
5. Write Java assignment statements to evaluate the following equations:
    (i)    Energy = mass(acceleration*height+(velocity)sqr(2)/2)
    (ii)   Torque = 2m1m2/m1+m2 * g
6. Design and write a Java program to define a class called Rectangle that contains members for representing its length and breadth. Provide members to get and set these attributes.
7. Design a class to represent a bank account. Include the following
   members: Data members:
   Name of the depositor
   Account number Type
   of account
   Balance amount in the account
   Methods:
   To assign initial values
   To deposit an amount
   To withdraw an amount after checking
   balance To display the name and balance
8. Write simple program to calculate the sum of digits of any number.
9. Write a simple program to display a "*" I triangle shape.
   Output will be like this
      *
       * * *
      * ****
10.   Write a simple program to call a method called simple from a main function. The method simple should accept an integer as an argument and calculate the square of the number in the method simple.
11. Write a Java program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use method overloading to achieve this.
12. Write a program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MultDiv that extends from AddSub class to use the member data of the superclass. MultDiv should have methods to multiply and divide. A main method should access the method and perform the mathematical operations.
13. Write an interface with a method called display. Implement this method I a class to display two names.
14. Write an interface that has two methods called push and pop of a stack. Write a class to implement the two methods for a fixed size stack creation.
15. Write a small program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.
16. Write a program to handle Null Pointer Exception and use the finally clause to display a message to the user.
17. Write a Java program that takes a string and converts it into uppercase and lowercase letters.
18. Write a Java program to find the volume of a sphere and a cone.
19. Write a Java program to convert rupees to dollars.
20. Write a Java program to find x to the power y. Use overloading for different cases when x and y are combinations of integer and floating point numbers.

21. Create an abstract class called Figure that has an abstract method called draw (). Make the subclasses called Filled_Rectangle, Filled_Arc and override the draw method in which you would print the message regarding the current object.
22. Write a Java program that has integer variables a, b, c and result as float. Store some values in them and apply the formula result = a/(b-c). Catch the probable exception.

23. Write a Java program that accepts two strings as command line arguments. It checks for the number of command line arguments. If they are less or more it throws an exception giving an appropriate message.
24. Write applets to draw the following shapes:
    (i)  Cone
    (ii) Cylinder
    (iii) Cube
    (iv) Square inside a circle
    (v) Circle inside a square
25. Write an applet to display the following figure:
26. Write an applet to display a face.
27. Write an applet to display five buttons.
28. Write an applet to illustrate BorderLayout.
29. Write a Java program to create 5 threads by extending Thread class.
30. Write a Java program to create 5 threads by implementing Runnable interface.

# UNIX OPERATING SYSTEM & SHELL PROGRAMMING LAB

| Course Code | L | T | P | Credit |
|-------------|---|---|---|--------|
| BCA521 | 0 | 0 | 2 | 1 |

## List of Unix Programmes

**1.** Write a Shell Script that takes a search string and filename from the terminal & displays the results.
**2.** Write a Shell Script that takes pattern and filename as command line arguments and displays the results appropriately i.e. pattern found/pattern not found.
**3.** Write a Shell Script that accepts only three arguments from the command line. The first argument is the pattern string, the second argument is the filename in which the pattern is to be searches and the third argument is the filename in which the result is to be stored.
**4.** Write a Shell Script that accepts a filename as a command line argument and finds out if its a regular file or a directory. If its a regular file, then performs various tests to see if it is readable, writeable, executable etc.
**5.** Write a Shell Script which creates the following menu and prompts for choice from user and runs the chosen command.
> Today's date
> Process of user
> List of files
> Quit to UNIX

**6.** Write a Shell Script that computes the factorial of a given number
**7.** Write a Shell Script that works like a calendar reminding the user of certain things depending on the day of the week.
**8.** Write a Shell Script that changes the extension of a group of files from txt to doc
**9.** Write a Shell Script that accepts both filename and a set of patterns as positional parameters to a script.
**10.** Write a Shell Script which will redirect the output of the date command without the time into a file.
**11.** Write a Shell Script (using while loop) to execute endlessly (until terminated by user) a loop which displays contents of current directory, disk space status, sleep for 30 seconds and display the users currently logged in on the screen.
**12.** Write a Shell Script that receives two filenames as arguments. It should check whether content of the two files is same or not. If they are same, second file should be deleted.
**13.** If a number is input through the keyboard, WASS to calculate sum of its digits.
**14.** Write a Shell Script that performs a count-down either from 10 (default) or from the value that is entered by the user.
**15.** Write a Shell Script which takes a command line argument of Kms and by default converts that number into meters. Also provide options to convert km to dm and km to cm.
**16.** Write a Shell Script using for loop, which displays the message "Welcome to the UNIX System"
**17.** Write a Shell Script to change the filename of all files in a directory from lower-case to upper-case.
**18.** Write a Shell Script that examines each file in the current directory. Files whose names end in **old** are moved to a directory named **old files** and files whose names end in **.c** are moved to directory named **cprograms.**
**19.** Write a Shell Script which searches all files in the given directory (to be taken as command line argument) for the file having the title (to be taken as command line argument), as the first line in the file.
> a) Display the contents of the searched file.
> b) In the end, printthe the file is ###, where
> #    is small-sized if total no. of lines is <50
> #    is medium-sized if total no. of lines between 50&100
> #    is large-sized.

20. Write a shell script which reports names and sizes of all files in a directory (directory would be supplied as an argument to the shell script) whose size is exceeding 1000 bytes. The filenames should be printed in descending order of their sizes. The total number of such files should also be reported.

21. WASS for renaming each file in the directory such that it will have the current shell PID as an extension. The shell script should ensure that the directories do not get renamed.
22. WAP to calculate and print the first *m* Fibonacci numbers.
23. WASS that will receive any number of filenames as arguments. The shell script should check whether such files already exist. If they do, then it should be reported. The files that do not exist should be created in a sub-directory called **mydir**. The shell script should first check whether the sub-directory **mydir**exists in the current directory. If it doesn"t exist, then it should be created. If **mydir**already exists, then it should be reported along with the number of files that are currently present in **mydir**.
24. A shell script receives even number of filenames. Suppose four filenames are supplied, then the first file should get copied into second file, the third file should get copied into fourth and so on. If odd number of filenames is supplied then no copying should take place and an error message should be displayed.
25. WASS to identify all zero-byte files in the current directory and delete them. Before proceeding with deletion, the shell script should get a conformation from the user.
26. WASS to compute the **GCD** and **LCM** of two numbers.
27. Two numbers are entered through the keyboard. WAP to find the value of one number raised to the power of another.
28. WASS that prompts the user for the password. The user has maximum of 3 attempts. If the user enters the correct password, the message "Correct Password" is displayed else the message "Wrong Password".
29. WASS that repeatedly asks the user repeatedly for the "Name of the Institution" until the user gives the correct answer.
30. WAP to generate all combinations of 1, 2 and 3 using **for loop.**

**Examination Scheme:**

| Components | CT1 | PR | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 10 | 15 | 5 | 70 |

# DESIGNING AND SUPPORTING COMPUTER NETWORK

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA530 | 2 | 1 | 0 | 3 |

**Course Objective:**
The objective of the course is to give an overview how to design and support computer network.

**Course Contents:**

**Module I: Introducing Network Design Concepts**
Discovering Network Design Basics, Investigating Core Layer Design Considerations
Investigating Distribution Layer Consideration, Investigating Access Layer Design Considerations, Investigating Server Farms and Security, Investigating Wireless Network Considerations, Supporting WANs and Remote Workers

**Module II: Gathering Network Requirements**
Introducing Cisco Lifecycle Services, Explaining the Sales Process, Preparing for the Design Process, Identifying Technical Requirements and Constraints, Identifying Manageability Design Considerations

**Module III: Characterizing the Existing Network**
Documenting the Existing Network, Updating the Existing Cisco IOS, Upgrading Existing Hardware, Performing a Wireless Site Survey, Documenting Network Design Requirements

**Module IV: Identifying Application Impacts on Network Design** Characterizing
Network Applications, Explaining Common Network Applications
Introducing Quality of Service (QoS), Examining Voice and Video Options, Documenting Applications and Traffic Flows

**Module V: Creating the Network Design**
Analyzing the Requirements, Selecting the Appropriate LAN Topology, Designing the WAN and Remote Worker Support, Designing Wireless Networks, Incorporating Security

**Module VI: Using IP Addressing in the Network Design**
Creating an Appropriate IP Addressing Design, Creating the IP Address and Naming Scheme, Describing IPv4 and and IPv6

**Module VII: Prototyping the Campus Network**
Building a Prototype to Validate a Design, Prototyping the LAN, Prototyping the Server Farm

**Module VIII: Prototyping the WAN**
Prototyping Remote Connectivity, Prototyping WAN Connectivity, Prototyping Remote Worker Support

**Module IX: Preparing the Proposal**
Assembling the Existing Proposal Information, Developing the Implementation Plan
Planning for the Installation, Creating and Presenting the Proposal

Examination Scheme:

| Components | CT1 | A/C/Q | ATTD. | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

**Text & References:**
*Text:*
- CCNA-Discovery 4.0, module 4, Cisco Certified Networking Academy

*References:*
- Data Communication and Computer Network, Forozoun, TMH Publication
- Data Communication and Network, Stallings, PHI
- Computer Network, Tanenbaum, PHI

# WEB PROGRAMMING

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA531 | 2 | 1 | 0 | 3 |

**Course Objective:**

This course is aimed to provide a fundamental understanding of web site creation. HTML is the language used for designing most basic web pages. Syllabus include basic and advanced features of HTML which includes images, links, tables, frames and forms etc. It also gives an overview of XML.

**Course Contents:**

**Module I: Introduction to HTML programming**

History of HTML, Structure of HTML, Adding Comments, Formatting Text, Creating List, Creating Definition List, Creating Hyper Text Links, Creating Link Lists, Inserting Inline Images, Creating Image Links, Horizontal Rules, Address Tag, Working with Text
Changing font Sizes and Colors, Using Background Image, Marquee Tag.

**Module II**

Tables and frames, Creating Tables, Table Element, Adding Border, Adding Column Headings, Adding Spacing and Padding, Adding a Caption, Setting the table Width and Height, Add Row Headings, Aligning Cell contents, Setting Column Width, Centering a Table, Inserting and Image, Spannig Columns, Spanning Rows Assigning Backgroung Colors, Frame Elements, Creation of Frame Based Pages, Noframes Element.

**Module III**

Forms and Java Script Introduction to Forms, Form Elements, Front level validations using JavaScript

**Module IV**

Cascading style sheets, Overview of style sheets, Different ways to use style sheets, Selectors DIV and SPAN Elements, Adding style to a Document, Use id Classes and Ids, Style Sheet Properties.

**Module V: XML**

Introduction to XML, XML Basics, XML Structure, Developing a DTD from XML code, Viewing XML, Viewing XML using the XML Data Source Object, Viewing XML using Style Sheets.

Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

**Text & References:**

- Harvey & Paul Deitel & Associates, Harvey Deitel and Abbey Deitel, "Internet and World Wide Web - How To Program", Fifth Edition, Pearson Education, 2011.
- Achyut S Godbole and Atul Kahate, "Web Technologies", Second Edition, Tata McGraw Hill, 2012.
- Thomas A Powell, Fritz Schneider, "JavaScript: The Complete Reference", Third Edition, Tata McGraw Hill, 2013.
- David Flanagan, "JavaScript: The Definitive Guide, Sixth Edition", O'Reilly Media, 2011

# DATA WAREHOUSING & DATA MINING

| Course Code | L | T | P | Credit |
|-------------|---|---|---|--------|
| BCA532 | 2 | 1 | 0 | 3 |

## Course Objective:

This course unit is divided into two parts: one on Data Warehousing and one on Data Mining. Both data warehousing and data mining are advanced recent developments in database technology which aim to address the problem of extracting information from the overwhelmingly large amounts of data which modern societies are capable of amassing. Data warehousing focuses on supporting the analysis of data in a multidimensional way. Data mining focuses on inducing compressed representations of data in the form of descriptive and predictive models. Course gives an in-depth knowledge of both the concepts.

## Course Contents:

**Module I: Data Warehousing**
Introduction to Data Warehouse, its competitive advantage, Data warehouse Vs Operational Data, Things to consider while building Data Warehouse

**Module II: Implementation**
Building Data warehousing team, Defining data warehousing project, data warehousing project management, Project estimation for data warehousing, Data warehousing project implementation

**Module III: Techniques**
Bitmapped indexes, Star queries, Read only table spaces, Parallel Processing, Partition views, Optimizing extraction process

**Module IV: Data Mining**
Introduction to Data Mining, benefits of Data Mining, How it helps in decision making, Data mining techniques, Introduction to Data Mart, Data Mart Tools, Data warehouse vs Data Mart, OLAP and its need, MOLAP and ROLAP

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|------------|-----|-------|------|-----|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- Data Warehousing in the real world, Sam Anchory and Dennis Murray

*References:*
- Data Mining, Pieter Adrians and Doif Zantinge

# DESIGNING AND SUPPORTING COMPUTER NETWORK LAB

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA522 | 0 | 0 | 2 | 1 |

## Course Contents:

1.  Process of Core Layer Design Consideration

2.  Process of Access Layer Design Consideration

3.  Preparing the Design Process, technical requirements.

4.  Documentation Design of Existing Network in the Enterprise.

5.  Document tation Design of Network Design Requirements.

6.  Documenting application and traffic flow in Enterptrise network.

7.  Selection of the Appropriate LAN Topology

8.  Designing WAN and Wireless Network and Incorporating Security.

9.  Creating an IP addressing Design with example enterprise network.

10. Prototype Design of LAN, Server Farm and WAN Connectivity.

## Examination Scheme:

| IA | | | | EE | |
|---|---|---|---|---|---|
| A | PR | LR | V | PR | V |
| 5 | 10 | 10 | 5 | 35 | 35 |

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# WEB PROGRAMMING LAB

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA523 | 0 | 0 | 2 | 1 |

1) Create a web page with the following using HTML5 (i) To embed an image map in a web page (ii) To fix the hot spots (iii) Show all the related information when the hot spots are clicked.
2) Create a web page with all types of Cascading style sheets.
3) Implement Client Side Scripts for Validating Web Form Controls using JavaScript.
4) Designing Quiz Application Personal Information System/ Using JavaScript
5) Write a JavaScript for Loan Calculation.
6) Develop and demonstrate a HTML file that includes JavaScript that uses functions for the following problems: a) Parameter: A string Output: The position in the string of the left-most Parameter vowel b): A number Output: The number with its digits in the reverse order
7) Develop PHP program using Arrays, control structures, looping structures and Form Handling
8) Using PHP and MySQL, develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.
9) Write an AJAX program for parsing a JSON file and formatting the output.
10) Develop a web application for Airline Reservation System using PHP & AJAX.

# DATA WAREHOUSING AND DATA MINING LAB

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA524 | 0 | 0 | 2 | 1 |

**Software Required:** Informatica Tool, Cognos, Todd.

**List of Programmes:**

1. Write a program to implement text mining.
2. Write a program to implement web mining.
3. Write a program to develop snowflake schema.
4. Write a program to develop the tree schema with the help of binary tree.
5. Write a program to implement BFS and DFS with respect to 2-D modeling.
6. Write a program to implement the basic step of informatics tool.

.

**Examination Scheme:**

| IA | | | | EE | |
|---|---|---|---|---|---|
| A | PR | LR | V | PR | V |
| 5 | 10 | 10 | 5 | 35 | 35 |

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# COMMUNICATION SKILLS - III

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCS501 | 1 | 0 | 0 | 1 |

## Course Objective:
To equip the participant with linguistic skills required in the field of science and technology while guiding them to excel in their academic field.

## Course Contents:

**Module I**
Reading Comprehension
Summarising
Paraphrasing

**Module II**
Essay Writing
Dialogue Report

**Module III**
Writing Emails
Brochure
Leaflets

**Module IV: Introduction to Phonetics**
Vowels
Consonants
Accent and Rhythm
Accent Neutralization
Spoken English and Listening Practice

## Examination Scheme:

| Components | CT1 | CT2 | CAF | V | GD | GP | A |
|---|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 25 | 10 | 10 | 10 | 5 |

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

## Text & References:

- Effective English for Engineering Students, B Cauveri, Macmillan India
- Creative English for Communication, Krishnaswamy N, Macmillan
- A Textbook of English Phonetics, Balasubramanian T, Macmillan

# BEHAVIOURAL SCIENCE - V

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BSS501 | 1 | 0 | 0 | 1 |

## Course Objective:
This course aims at enabling students towards:
- Understand the importance of individual differences
- Better understanding of self in relation to society and nation
- Facilitation for a meaningful existence and adjustment in society
- To inculcate patriotism and National pride.
- To enhance personal and professional excellence

## Course Contents:

**Module I: Individual differences& Personality**
Personality: Definition& Relevance
Importance of nature & nurture in Personality Development
Importance and Recognition of Individual differences in Personality
Accepting and Managing Individual differences (Adjustment Mechanisms)
Intuition, Judgment, Perception & Sensation (MBTI)
BIG5 Factors

**Module II: Socialization**
Nature of Socialization
Social Interaction
Interaction of Socialization Process
Contributions to Society & Nation

**Module III: Patriotism and National Pride**
Sense of Pride and Patriotism
Importance of Discipline and hard work
Integrity and accountability

**Module IV: Human Rights, Values and Ethics**
Meaning of Human Rights
Human Rights Awareness
Importance of human rights
Values and Ethics- Learning based on project work on Scriptures like Ramayana, Mahabharata, Gita etc

**Module V: Personal and Professional Excellence**
Personal excellence:
Identifying Long-term choices and goals
Uncovering talent, strength and style
Alan P. Rossiter"s eight aspects of Professional Excellence
Resilience during challenge and loss
Continued Reflection (Placements, Events, Seminars, Conferences, Projects, Extracurricular Activities, etc.)

**Module VI: End-of-Semester Appraisal**
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

## Examination Scheme:

| Components | SAP | A | Mid Term Test (CT) | VIVA | Journal for Success (JOS) |
|---|---|---|---|---|---|
| **Weightage (%)** | 20 | 05 | 20 | 30 | 25 |

**Text & References:**

- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressler, David and Cans, Donald: The Study of Human Interaction
- Lapiere, Richard. T – Social Change
- Rose, G.: Oxford Textbook of Public Health, Vol.4, 1985.
- Robbins O.B.Stephen;. Organizational Behaviour

# FRENCH - V

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLF501 | 2 | 0 | 0 | 2 |

## Course Objective:

To furnish some basic knowledge of French culture and civilization for understanding an authentic document and information relating to political and administrative life

## Course Contents:

**Module D:pp. 131 – 156 Unités 10,11**

**Contenu lexical:**        **Unité 10:** Prendre des décisions
1. Faire des comparaisons

   2. décrire un lieu, le temps, les gens, l'ambiance
3. rédigerune carte postale

**Unité 11: faire face aux problèmes**
   1. Exposer un problème.
   2. parler de la santé, de la maladie
   3. interdire/demander/donneruneautorisation
   4. connaître la vie politiquefrançaise

**Contenu grammatical:**
   1. comparatif - comparer des qualités/ quantités/actions
   2. supposition: Si + présent, futur
   3. adverbe - caractériserune action
   4. pronom "Y"

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

- le livre à suivre: Campus: Tome 1

# GERMAN - V

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLG501 | 2 | 0 | 0 | 2 |

## Course Objective:
To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Advanced Grammar and Business Language and Professional Jargon

## Course Contents:

### Module I: Genitive case
Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

### Module II: Genitive prepositions
Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

### Module III: Reflexive verbs
Verbs with accusative case
Verbs with dative case
Difference in usage in the two cases

### Module IV: Verbs with fixed prepositions
Verbs with accusative case
Verbs with dative case
Difference in the usage of the two cases

### Module V: Texts
A poem „Maxi"
A text Rocko

### Module VI: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture; Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:
- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs

# SPANISH - V

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLS501 | 2 | 0 | 0 | 2 |

## Course Objective:
To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations with ease.

## Course Contents:

**Module I**
Revision of earlier semester modules

**Module II**
Future Tense

**Module III**
Presentations in English on
Spanish speaking countries"
Culture
Sports
Food
People
Politics
Society
Geography

**Module IV**
Situations:
En el hospital
En la comisaria
En la estacion de autobus/tren
En el banco/cambio

**Module V**
General revision of Spanish language learnt so far.

## Examination Scheme:

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

## Text & References:

- Español Sin Fronteras, Greenfield

# CHINESE – V

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| FLC501 | 2 | 0 | 0 | 2 |

## Course Objective:

What English words come from Chinese? Some of the more common English words with Chinese roots areginseng, silk, dim sum, fengshui, typhoon, yin and yang, T"al chi, kung-fu. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

## Course Contents:

**Module I**
Drills
Dialogue practice
Observe picture and answer the question.
Pronunciation and intonation.
Character writing and stroke order

**Module II**
Intonation
Chinese foods and tastes – tofu, chowmian, noodle, Beijing duck, rice, sweet, sour….etc. Learning to say phrases like – Chinese food, Western food, delicious, hot and spicy, sour, salty, tasteless, tender, nutritious, god for health, fish, shrimps, vegetables, cholesterol is not high, pizza, milk, vitamins, to be able to cook, to be used to, cook well, once a week, once a month, once a year, twice a week……
Repetition of the grammar and verbs taught in the previous module and making dialogues usingit.
Compliment of degree "de".

**Module III**
Grammar the complex sentence "suiran … danshi…."
Comparison – It is colder today than it was yesterday…..etc.
The Expression "chule….yiwai". (Besides)
Names of different animals.
Talking about  Great Wall of China
Short stories

**Module IV**
Use of "huozhe" and "haishi"
Is he/she married?
Going for a film with a friend.
Having a meal at the restaurant and ordering a meal.

**Module V**
Shopping – Talking abut a thing you have bought, how much money you spent on it? How many kinds were there? What did you think of others?
Talking about a day in your life using compliment of degree "de". When you get up? When do you go for class? Do you sleep early or late? How is Chinese? Do you enjoy your life in the hostel?
Making up a dialogue by asking question on the year, month, day and the days of the week and answer them.

**Examination Scheme:**

| Components | CT1 | CT2 | C | I | V | A |
|---|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 15 | 5 |

C – Project + Presentation
I – Interaction/Conversation Practice

**Text & References:**

- "Elementary Chinese Reader " Part-II Lesson 39-46

# MULTIMEDIA AND ITS APPLICATIONS

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA601 | 3 | 1 | 0 | 4 |

## Course Objective:

The objective of the course is to give an overview of different multimedia technologies like audio and video including multimedia devices. The course also includes some practical sessions on these technologies.

## Course Contents:

**Module I: Introduction**
Multimedia and personalized computing, a tour of emerging applications, multimedia systems, computer communication, and entertainment products, a framework of multimedia systems.

**Module II: Digital Audio Representation and Processing**
Uses of audio in computer applications, digital representation of sound, transmission of digital sound, digital audio signal processing, digital audio and the computer.

**Module III: Video Technology**
Raster scanning principles, sensors for T.V. cameras, color fundamentals, color video, video equipment, worldwide television standards.

**Module IV: Digital Video and Image Compression**
Evaluating a compression system, redundancy and visibility, video compression techniques, the JPEG image compression standards, the MPEG motion video compression standard, DVI technologies, Time Based Media Representation and Delivery.

**Module V: Multimedia Devices, Presentation Services and the User Interface**
Introduction Multimedia services and Window systems, client control of continuous media, device control, temporal co ordination and composition, hyper application.

**Module VI: Application of Multimedia**
Intelligent multimedia system, desktop virtual reality, multimedia conferencing.

## Examination Scheme:

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 10 | 15 | 5 | 70 |

## Text & References:

- Multimedia systems John F. Koegal Buford Addison- Wesley

# PROJECT WORK/DISSERTATION

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA660 | 0 | 0 | 0 | 9 |

## GUIDELINES FOR PROJECT FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation. Research is genuine exploration of the unknown that leads to new knowledge, which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

### In general, the File should be comprehensive and include:

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

## Report Layout

The report should contain the following components:

### 1. File should be in the following specification:

- A4 size paper
- Font: Arial (10 points) or Times New Roman (12 points)
- Line spacing: 1.5
- Top & bottom margins: 1 inch/ 2.5 cm
- Left & right margins: 1.25 inches/ 3 cm

**2. Report Layout:** The report should contain the following
components Front Page
Table of Contents
Acknowledgement
Student Certificate
Company Profile
Introduction Chapters
Appendices References /
Bibliography

- **Title or Cover Page or Front Page**
  The title page should contain the following information: Project Title; Student"s Name; Course; Year; Supervisor"s Name.
- **Table of Contents**
Titles and subtitles are to correspond exactly with those in the text.
- **Acknowledgement**
  Acknowledgment to any advisory or financial assistance received in the course of work may be given.
- **Student Certificate**
  Given by the Institute.
- **Company Certificate & Profile**
  This is a certificate, which the company gives to the students. A Company Profile corresponds to a file with company-specific data. Company data can be stored there and included in a booking when needed.

### ▲ Introduction

Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

### ▲ Chapters

All chapters and sections must be appropriately numbered, titled and should neither be too long nor too short in length.

The first chapter should be introductory in nature and should outline the background of the project, the problem being solved, the importance, other related works and literature survey. The other chapters would form the body of the report. The last chapter should be concluding in nature and should also discuss the future prospect of the project.

### ▲ Appendices

The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

### ▲ References / Bibliography

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

## ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project. Project execution is concerned with assessing how much work has been put in. The File should fulfill the following *assessment objectives:*

1. **Range of Research Methods used to obtain information**

2. **Execution of Research**

3. **Data Analysis**
   🎬 Analyze Quantitative/ Qualitative information
   🎬 Control Quality

4. **Draw Conclusions**

### Examination Scheme:

| Components | MRP | V | S | FP | R |
|---|---|---|---|---|---|
| Weightage (%) | 20 | 20 | 20 | 20 | 20 |

MRP – Mid Report Presentation, V – Viva, S – Synopsis, FP – Final Presentation, R - Report

# MULTIMEDIA & ITS APPLICATIONS LAB

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA620 | 0 | 0 | 2 | 1 |

## Course Contents:

1. Create the animation of flying bird in flash.
2. Create the animation of walking man with his arms and legs moving.
3. Create the animation of Virtual typewriter.
4. Show an example of Masking in flash.
5. Make an animation of bouncing ball using flash.
6. Create the animation of moving Car in flash.
7. Make the blinking colorful text in flash.
8. Make a scenery showing rising sun in it using flash.
9. Show a flower growing in a flower pot.
10. Create the animation to show an accident of two cars coming from opposite direction using flash
11. Create the animation to show an accident of two cars going in the same direction with variation in the speed.
12. Create the animation to show the 9/11 attack in U.S.A.
13. Create the animation to show a Gardner watering the flower.
14. Make an animation to show a charismas tree growing step by step.
15. Create the animation to show the lightening of charismas tree using more than one layer.

## Examination Scheme:

| IA | | | | EE | |
|---|---|---|---|---|---|
| A | PR | LR | V | PR | V |
| 5 | 10 | 10 | 5 | 35 | 35 |

Note: IA –Internal Assessment, EE- External Exam, PR- Performance, LR – Lab Record, V – Viva.

# NETWORK SECURITY

| Course Code | L | T | P | Credit |
|-------------|---|---|---|--------|
| BCA630 | 2 | 1 | 0 | 3 |

## Course Objective:

This subject is very important for students because Security of data in transit over the Internet becomes increasingly necessary because of steadily growing data volume and importance. Nowadays, every user of a public network sends various types of data, from email to credit card details daily, and he would therefore like them to be protected when in transit over a public network. To this end, a practical SSL protocol has been adopted for protection of data in transit that encompasses all network services that use TCP/IP to support typical application tasks of communication between servers and clients. In this subject student will learn all security method for securing public & private network by configuring different protocols.

## Course Contents:

**Module I: Threats and Cryptography**
Introduction: Attacks, Services and Mechanism, Model for Internetwork Security.
Cryptography: Notion of Plain Text, Encryption, Key, Cipher Text, Decryption and cryptanalysis; Public Key Encryption, Conventional Encryption Techniques, Steganography, Modern Techniques – DES, DES chaining, Triple DES, RSA Algorithm.

**Module II: Network Security**
Authentication Application: Kerberos, X.509, Directory Authentication Service, Pretty Good Privacy, S/Mime, Digital Signature & Digital Signature Standard.

**Module III: Network Security Applications**
IP security Architecture: Overview, Authentication header, Encapsulating Security Pay Load, combining Security Associations, Key Distribution & Management.
Web Security: Requirements, Secure Socket Layer, Transport Layer Security, and Secure Electronic Transactions.

**Module IV: System Security**
Firewalls and protocols, Design Principles of Firewalls, Trusted systems, Virus & Intruders, IT act and cyber laws (Global Standards), Virtual Private Network – Issues relating to network security, Recent attacks on networks.

## Examination Scheme:

| Components | CT1 | PR. | ATTD. | EE |
|------------|-----|-----|-------|-----|
| Weightage (%) | 10 | 15 | 5 | 70 |

## Text & References:

*Text:*
- W. Stallings, Networks Security Essentials: Application & Standards, Pearson Education, 2000
- W. Stallings, Cryptography and Network Security, Principles and Practice, Pearson Education, 2000.

*References:*
- Network Security: The Complete Reference by Roberta Bragg, Mark Rhodes-Ousley, Keith Strassberg, et al - Tata McGraw-Hill presents
- Network Security: The Complete Reference by Roberta Bragg, Mark Rhodes-Ousley, Keith Strassberg, et al - Tata McGraw-Hill presents

# WEB TECHNOLOGIES

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA631 | 2 | 1 | 0 | 3 |

**Course Objective:**
This course is aimed to provide a fundamental understanding of web site creation. HTML is the language used for designing most basic web pages. Syllabus include basic and advanced features of HTML which includes images, links, tables, frames and forms etc. It also gives an overview of XML.

**Course Contents:**
**Module I: Introduction to html programming**
History of HTML, Structure of HTML, Adding Comments, Formatting Text, Creating List, Creating Definition List, Creating Hyper Text Links, Creating Link Lists, Inserting Inline Images, Creating Image Links, Horizontal Rules, Address Tag, Working with Text, Changing font Sizes and Colors, Using Background Image, Marquee Tag.

**Module II: Tables and frames**
Creating Tables, Table Element, Adding Border, Adding Column Headings, Adding Spacing and Padding, Adding a Caption, Setting the table Width and Height, Add Row Headings, Aligning Cell contents, Setting Column Width, Centering a Table, Inserting and Image, Spannig Columns, Spanning Rows Assigning Backgroung Colors, Frame Elements, Creation of Frame Based Pages, Noframes Element.

**Module III: Forms and JavaScript**
Introduction to Forms, Form Elements, Front level validations using JavaScript

**Module IV: Cascading style sheets**
Overview of style sheets, Different ways to use style sheets, Selectors DIV and SPAN Elements, Adding style to a Document, Use id Classes and Ids, Style Sheet Properties.

**Module V: XML**
Introduction to XML, XML Basics, XML Structure, Developing a DTD from XML code, Viewing XML, Viewing XML using the XML Data Source Object, Viewing XML using Style Sheets.

**Examination Scheme:**

| Components | CT1 | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 10 | 15 | 5 | 70 |

**Text & References:**

*Text:*
- HTML, DHTML, JavaScript, Perl, CGI, Ivan Bayross, BPB Publication.

*References:*
- HTML Complete Reference, BPB Publication.
- Internet for everyone, Alexis Leon and Mathew Leon, Leon Tech world.

# CLOUD COMPUTING

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA632 | 2 | 1 | 0 | 3 |

## Course Objective
- To understand the concept of Virtualization and design of cloud Services
- To introduce the broad perceptive of cloud architecture and model
- To learn to design the trusted cloud Computing system
- To apply different cloud programming model as per need.
- To understand the features of cloud simulator
- To be familiar with the lead players in cloud.

## Course Contents

### MODULE I: CLOUD ARCHITECTURE AND MODEL
Technologies for Network-Based System – System Models for Distributed and Cloud Computing – NIST Cloud Computing Reference Architecture. Cloud Models:- Characteristics – Cloud Services – Cloud models (IaaS, PaaS, SaaS) – Public vs Private Cloud –Cloud Solutions - Cloud ecosystem – Service management – Computing on demand.

### MODULE II: VIRTUALIZATION
Basics of Virtualization - Types of Virtualization - Implementation Levels of Virtualization - Virtualization Structures - Tools and Mechanisms - Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource management – Virtualization for Data-center Automation.

### MODULE III: CLOUD INFRASTRUCTURE
Architectural Design of Compute and Storage Clouds – Layered Cloud Architecture Development – Design Challenges - Inter Cloud Resource Management – Resource Provisioning and Platform Deployment – Global Exchange of Cloud Resources.

### MODULE IV: PROGRAMMING MODEL
Parallel and Distributed Programming Paradigms – MapReduce , Twister and Iterative MapReduce – Hadoop Library from Apache – Mapping Applications - Programming Support - Google App Engine, Amazon AWS - Cloud Software Environments -Eucalyptus, Open Nebula, OpenStack, Aneka, CloudSim

### MODULE V: SECURITY IN THE CLOUD
Security Overview – Cloud Security Challenges and Risks – Software-as-a-Service Security – Security Governance – Risk Management – Security Monitoring – Security Architecture Design – Data Security – Application Security – Virtual Machine Security - Identity Management and Access Control – Autonomic Security.

**Examination Scheme:**

| Components | CT | A/C/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

**Text & References:**
- John W.Rittinghouse and James F.Ransome, "Cloud Computing: Implementation, Management, and Security", CRC Press, 2010.
- Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", TMH, 2009.
- Kumar Saurabh, "Cloud Computing – insights into New-Era Infrastructure", Wiley India,2011.
- James E. Smith, Ravi Nair, "Virtual Machines: Versatile Platforms for Systems and Processes", Elsevier/Morgan Kaufmann, 2005.
- Ronald L. Krutz, Russell Dean Vines, "Cloud Security – A comprehensive Guide to Secure Cloud Computing", Wiley – India, 2010.

# MOBILE COMPUTING

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA633 | 2 | 1 | 0 | 3 |

**Course Objective:**
The objective of this subject is to make students familiar about the basic concepts mobile technology, computing and market

**Course Contents:**

**Module I:**
**Global System for Mobile Communication (GSM) system overview:** GSM Architecture, Mobility management, Network signalling. GSM Additional services: Teletext, Facsimile, Videotext services.

**Module II: (Wireless) Medium Access Control**
Motivation for a specialized
MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.
**Mobile Network Layer:** Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

**Module III: Mobile Transport Layer:** Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

**Module IV: Mobile Data Communication**
W LANs (Wireless LANs) IEEE 802.11 standard, Mobile IP.
**Third Generation (3G) Mobile Services:** Introduction to International Mobile Telecommunications 2000 (IMT 2000) vision, Wideband Code Division Multiple Access (W-CDMA), and CDMA 2000, Quality of services in 3G.

**Module V: Global Mobile Satellite Systems**
Mobile Satellite Systems (GEO, MEO and LEO), case studies of the IRIDIUM and GLOBALSTAR systems.

**Examination Scheme:**

| Components | A | CT | S/V/Q | HA | EE |
|---|---|---|---|---|---|
| Weightage (%) | 5 | 10 | 8 | 7 | 70 |

CT: Class Test, HA: Home Assignment, S/V/Q: Seminar/Viva/Quiz, EE: End Semester Examination; Att: Attendance

**Text & References:**

*Text:*
- "Mobile Communications", 2nd Edition, Jochen Schiller,2003

References:
- "Wireless and Mobile Networks Architectures", by Yi-Bing Lin & Imrich Chlamtac, John Wiley & Sons, 2001.
- "Mobile and Personal Communication systems and services", by Raj Pandya, Prentice Hall of India, 2001.
- "Third Generation Mobile Telecommunication systems", by P. Stavronlakis, Springer Publishers, 2001.

# ARTIFICIAL INTELLIGENCE

| Course Code | L | T | P | Credit |
|---|---|---|---|---|
| BCA634 | 2 | 1 | 0 | 3 |

## Course Objective:
The primary objective of this course is to provide an introduction to the basic principles, techniques, and applications of Artificial Intelligence. The emphasis of the course is on teaching the fundamentals and not on providing a mastery of specific commercially available software tools or programming environments. Upon successful completion of the course, you will have an understanding of the basic areas of artificial intelligence search, knowledge representation, learning and their applications in design and implementation of intelligent agents for a variety of tasks in analysis, design, and problem-solving. You will also be able to design and implement key components of intelligent agents of moderate complexity in Java and/or Lisp or Prolog and evaluate their performance.

## Course Contents:

**Module I: Introduction**
AI and its importance, AI Problem, Application area.

**Module II: Problem Representations**
State space representation, problem-reduction representation, production system, production system characteristics, and types of production system.

**Module III: Heuristic Search Techniques**
AI and search process, brute force search, depth-first search, breadth-first search, time and space complexities, heuristics search, hill climbing, best first search, A* algorithm and beam search.

**Module IV: Game Playing**
AI and game playing, plausible move generator, static evaluation move generator, game playing strategies, problems in game playing.

**Module V: Structured Knowledge**
Associative networks, frame structures, conceptual dependencies and scripts.

**Module VI: Logic**
Prepositional logic: syntax and semantics, First Order Predicate Logic (FOPL): Syntax and semantics, conversion to clausal form, inference rules, unification, and the resolution principles.

**Module VII: Knowledge Acquisitions**
Type of learning, Knowledge Acquisition, Early work in machine learning, learning by induction.

**Module VIII: Expert System**
Introduction to expert system, Phases of expert system, characteristics of expert system and a case study.

**Module IX: Introduction to Neural Network, Fuzzy Logic, Robotics, LISP and Prolog.**

Examination Scheme:

| Components | CT | HA/V/Q | Attd | EE |
|---|---|---|---|---|
| Weightage (%) | 15 | 10 | 5 | 70 |

## Text & References:

*Text:*
- Artificial Intelligence – II Edition, Elaine Rich, Kevin Knight TMH.

*References:*
- Foundations of Artificial Intelligence and Expert Systems, V S Janakiraman, K Sarukesi, P Gopalakrishan, Macmillan India Ltd.
- Introduction to AI and Expert System, Dan W. Patterson, PHI.