# Tilak Maharashtra Vidyapeeth, Pune

## Bachelor of Computer Application

- **Program outcome**
- Students of graduate degree program B.C.A. at the time of graduation will be able to gain
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- **PO1**- Knowledge of computer fundamentals: Here foundation of the subject becomes strong.
- **PO2**- Knowledge of programming basics.
- **PO3**- Introduction of logical and numerical methods:Necessary to develop logical thinking.
- **PO4**- Knowledge of computer networking.
- **PO5**- Knowledge of database management.
- **PO6**- Opportunity of entrepreneurship: The student can startup his own business firm or company of software development as well related software solutions.
- **PO7**- To demonstrate leadership capability, stimulate economical commitment and inculcate environmental protection
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**Course Outcome**

**SEM:I**

## Computer Fundamentals (40 Lectures)

**UNIT-1** **(10 Lecture)**

- Input Unit
- Output Unit
- Storage Unit
- Arithmetic Logic Unit
- Control Unit
- Central Processing Unit
- System Concept
- Memory Management

**UNIT-2** **(6 Lecture)**

- Non-positional Number System
- Positional Number System

- Binary Number System
- Octal Number System
- Hexadecimal Number System
- Converting from one number system to another
- Converting from another base to decimal
- Converting from decimal to another base
- Converting from a base other than 10 to another base other than 10
- Shortcut Methods for binary to octal conversion
- Shortcut method for Octal to binary
- Shortcut Method for Binary to hexadecimal
- Shortcut Method for hexadecimal to Binary
- Conversion examples

**UNIT-3** **(6 Lecture)**

- Boolean algebra
- Logic Gates
- AND,OR,NOT,NAND,NOR Gate
- Logic circuits
- Converting expression to logic circuit
- Universal NAND gate
- Universal NOR gate
- Exclusive OR and equivalence function
- Design of combinational circuit
- Design of Half- adder
- Design of Full- Adder

**UNIT-4** **(6 Lecture)**

- Planning the computer program
- Algorithm
- Flowcharts
- Symbols, Rules, Levels, Sample
- Advantages and limitations of Flow Charts
- Pseudo code
- Examples of Pseudo code and Algorithms

**UNIT-5** **(6 Lecture)**

- Process Management
- Multi-programming
- Multi-Tasking
- Multi-Threading
- Multi-Processing
- Time Sharing
- Memory Management
- File Management

**UNIT-6** **(6 Lecture)**

- Some popular operating Systems

- UNIX
- MS-DOS
- Windows XP
- Windows Vista
- Linux

**Reference Books**


| | | |
|---|---|---|
| Computer fundamentals | - | P.K. Sinha |
| Computer fundamentals | - | D.P. Nagpal |
| Computer fundamentals | - | B.Ram |
| Fundamental of computer | - | V. Rajaraman.B.Ram |
| Fundamental of computer | - | V. Rajaraman. |

# BCA – 142 Mathematics and Statistics (40 Lectures)

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|---|---|---|---|---|---|---|
| **Semester** | First | | | | Teaching Hrs = 35 | |
| **Subject Code** | BCA - 142 | | | | Practice/Assignment Hrs = 10 | |
| **Subject Name** | **Mathematics &Statistics** | | | | Total Hrs :- 45 | |
| **Teaching Scheme** | | | **Examination Scheme** | | | **Credits** |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **3** |

**Course Outcomes (COs)**

**After learning this course student will be able to**

- Recognize the importance and value of mathematical and statistical thinking, training, and approach to problem solving, on a diverse variety of disciplines.
- be familiar with a variety of examples where mathematics or statistics helps accurately explain abstract or physical phenomena
- Recognize and appreciate the connections between theory and applications.
- Independently read mathematical and statistical literature of various types, including survey articles, scholarly books, and online sources.
- Be life-long learners who are able to independently expand their mathematical or statistical expertise when needed, or for interest's sake.

## Part I. Mathematics (25 Hrs)

1. **SET THEORY** **(2 Hrs)**
   Set concept, Subset, Union and Intersection, Complement of a Set, Universal set and De Morgan's Law

2. **FUNCTION** **(3 Hrs)**
   Number System, Preliminary Concepts, All types of Functions and Relations

3. **SEQUENCES, SERIES AND PROGRESSION** **(4 Hrs)**

   Arithmetic progression, geometric progression, numeric progression, Means numerical problems, Arithmetic, geometric, finite and infinite series

4. **PERMUTATIONS AND COMBINATIONS** **(3 Hrs)**

   Fundamental principles, permutations, combinations, Simple Relations, numerical problems

5. **LINEAR EQUATIONS** **(4 hrs)**

   Determinants, Matrices, Types of matrices
   Linear Homogeneous and Linear non-homogeneous equations

6. **QUADRATIC EQUATIONS** **(4 Hrs)**
   Formation of equations, Roles nature of roots of quadratic, equation, complex, numbers

7. **PROBABILITY** **(4 Hrs)**

   Theorems, Probability, Conditional Probability, Events and Probability Model

**8. BINARY SYSTEMS (1 Hr)**

Binary digits, bit, byte, Binary Operations, Boolean relations
Diagrams interrelation with Boolean, matrix and Diagraphs

## Part II. Statistics (15 Hrs)

**1. STATISTICS (1 Hr)**

Importance of statistics, scope of statistics in industry Economics, social sciences, management's sciences

**2. STATISTICAL DATA (4 Hrs)**

Types, variable, raw data attributes, primary and secondary data, Graphical representation of data, histogram, frequency, polygon, Ogive curves, diagrammatic representation of data. Simple bar diagram, subdivided bar diagram, pie diagram.

**3. MEASURES OF CENTRAL TENDENCY (3 Hrs)**

Concepts of central tendency of data, arithmetic mean, median, mode, Effects of change of origin scale on mean, numerical problems.

**4. MEASURES OF DISPERSION (2 Hrs)**

Measures of dispersion absolute and relative measure of depression, Range, mean, variance, standard deviation coefficient of variation. Numerical problems.

**5. CORRELATION (2 Hrs)**

Correlation concept, Covariance, Coefficient of Correlation and Numerical problems

**6. INDEX NUMBERS (1 Hr)**

Price and quantity index numbers, Laspeyre's, Paasche's and Fisher's properties and Numerical

Reference Books:

Mathematics and Statistics: -M. L. Vaidya, M. K. Kelkar
Statistical Analysis: -A Computer Oriented Approach
Introduction to Mathematical Statistics
Introduction to calculus of finite differences -Richardson C.

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|---|---|---|
| **Semester** | First | Teaching Hrs = 26 |
| **Subject Code** | BCA – 143 | Practice/Assignment Hrs = 4 |
| **Subject Name** | **Basic English** | Total Hrs :- 30 |

| Teaching Scheme | | | Examination Scheme | | | Credits |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **2** |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

* Read and understand basic expressions and short, simple texts.
* Engage in simple oral communications in order to provide and obtain essential information, using appropriate pronunciation.
* Write basic, simple sentences leading to a paragraph.
* Demonstrate limited control of essential grammatical structures.

## BCA – 143 Basic English (30 Lecture)

**SECTION – I**

### 1. Grammar (15 Lecture)

- Use of Articles and Prepositions
- Tense
- Transformation of Sentences
- Parts of Speech
- Idioms and Phrases
- Vocabulary
  a) Synonyms
  b) Antonyms
  c) One Word Substitution
  d) Homophones & Homonyms
- Punctuations
- Common Errors
- Spelling in English

**SECTION – II**

### 2. Composition (15 Lecture)

- Formal & Informal Writing
- Precise
- Essay Writing
- Report Writing
- Reading Comprehension

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|---|---|---|---|---|---|---|
| **Semester** | First | | | | Teaching Hrs = 40 | |
| **Subject Code** | BCA – 145 | | | | Practice/Assignment Hrs = 20 | |
| **Subject Name** | **C Programming** | | | | Total Hrs :- 60 | |
| **Teaching Scheme** | | | **Examination Scheme** | | | **Credits** |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **4** |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

- Adequately explain functioning of computer components.
- Explain the process of problem solving using computer
- Design an algorithmic solution for a given problem
- Write a C program for a given algorithm.
- Trace the given C program manually.
- Write C program for simple applications of real life using structures and files.

## BCA-145- C Programming

Total Lectures: 40 Hr

**1. LOGIC DEVELOPMENT**: 4 Hr

Variable & Constants, Operators, Programming Constructs, Sequence, Selection Iteration.

**2. INTRODUCTION TO FLOWCHARTING**: 4 Hr

What Are Flowcharts? Types of Flowcharts, Advantages of Flowcharts, Flowchart Symbols, Use Of Symbols, Developing Flowcharts, Flowchart Aesthetics.

**3. TECHNIQUES:** 4 Hr

Flowchart For Computations, Flowcharts For Decision Making, Flowcharts For Loops Predefined Process, Arrays.

**4. INTRODUCTION TO C**

DATA TYPES AND OPERATORS: 4 Hr

Instruction in C, Operators, Type Conversions, Operator precedence in C, Data Types Revisited

INPUT / OUTPUT:

Introduction, Unformatted I/O Functions, Formatted I/O Functions.

**5. CONTROL STATEMENTS:** 3 Hr

Decision Control Instruction, Loop control or Iteration instructions, Case Control Instructions, Jump Statements.

**6. FUNCTIONS:** 4 Hr

What is a Function? , Why use Functions? Passing Value between Functions, Scope Rule of Functions, Advanced features of Functions.

**8. ARRAYS AND STRINGS**: 4 Hr

Introduction, One Dimensional Array, Two Dimensional Arrays, Strings, String Library Functions, Two Dimensional Arrays of Characters.

**9. POINTERS:** 4 Hr

Pointers Overview, Pointers and Functions, Pointers and Arrays, Dynamic Memory Allocation, Pointers to Pointers.

**10. STRUCTURES** 5 Hr

Introduction, Declaring a Structure and Union, Array of Structure, Assigning a Structure variable to another variable, Nesting of Structure, Passing a Structure variable to a Function, Pointers and Structures, User defined Data Types.

**11. FILE MANIPUALATION**: 4 Hr

Introduction, Unformatted High level Disk Input Output functions, Character Input output in Files, Command Line Arguments, String Input Output in Files, Formatted High level Dist I/O Functions, Direct Input Output

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|---|---|---|---|---|---|---|
| **Semester** | First | | | | Teaching Hrs = 40 | |
| **Subject Code** | BCA-146 | | | | Practice/Assignment Hrs = 20 | |
| **Subject Name** | Network Fundamentals | | | | Total Hrs :- 60 | |
| **Teaching Scheme** | | | **Examination Scheme** | | | **Credits** |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **4** |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

- To master the terminology and concepts of the ISO-OSI reference model and the TCP-IP reference model.
- To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks,
- To be familiar with wireless networking concepts,
- To be familiar with contemporary issues in networking technologies,
- To be familiar with network tools and network programming
- To master understanding external and internal threats to an organization,
- To be familiarity with information security awareness and a clear understanding of its importance,
- To master protocols for security services.

**BCA 146 - Network Fundamentals**

1. **Basics of Computer Network**

Define computer network, identifying basic networking elements and describing roles of Clients, Server, Peers, and Transmission Media & Protocols Network Services: File, print, Message, Database Application Identifying Differences bet. Centralized & distributed network architecture Identifying appropriate transmission media to meet a business need .Cable Media & Wireless Media, Network Connectivity devices, Modern repeaters, Hubs Bridges, Multiplexes and routers

**2. OSI Layers**

Identifying 7 Layers of OSI

Physical Layer: Connection types used in Computer Network, Common Physical technologies used in computer

Network: BUS, Ring, Star, Cellular, Analog & Digital Signals, bandwidth

Data link Layer: Purpose of data link Layer, Switching Methods, Routing, Network layer connection services, Bridging

Transport Layer: Purpose of transport layer, Address name resolution, Flow control, Error control

Session Layer: Purpose of Session Layer, Session Administration, Dialog control methods

Presentation Layer: Purpose of Presentation Layer, Application Layer: Purpose of Application Layer

**3. TCP/IP Fundamentals**

Identifying Network Classes, obtain register IP address, Domains, how Host name, host table and DNS work. Windows Internet naming services (WINS), Subnets, Subnets mask Assigning and managing IP subnets.

**4. Network Operating System**

Introduction to Windows XP /Vista and Windows 7 as desktop operating systems and Sharing files and folders in Windows Network, Printing in Windows Network.

Introduction to Windows 2003 and windows 2008 as Network operating system ,Working with NDS Basics, Creating Users and Login scripts

**Reference Books**

Computer Networks Tanenbum

Local area Networks Keiser / D. Comer

# TILAK MAHARASHTRA VIDYAPEETH

## BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEM:II

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|---|---|---|
| **Semester** | Second | Teaching Hrs = 35 |
| **Subject Code** | BCA – 241 | Practice/Assignment Hrs = 10 |
| **Subject Name** | **Communication Skills** | Total Hrs :- 45 |

| Teaching Scheme | | | Examination Scheme | | | Credits |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **3** |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

- Demonstrate critical and innovative thinking.
- Display competence in oral, written, and visual communication.
- Apply communication theories.
- Show an understanding of opportunities in the field of communication.
- Use current technology related to the communication field.
- Respond effectively to cultural communication differences.
- Communicate ethically.
- Demonstrate positive group communication exchanges.

# BCA 241 –Communication Skills

**1. The Types of Business Communication** **4** Hr

Business Communication
The Classification, Functions & Scope of Business Communication
Internal Communication
External Communication

**2. The Communication Process** **4** Hr

Elements of Communication
The Communication Cycle
The Barriers To Communication

**3. The Principles of Communication** **4** Hr

The Medium of Communication
Accuracy
Brevity
Clarity
Courtesy

**4. The Modes of Communication** **6** Hr

Introduction
The Types of Communication
Oral Communication
Written Communication
Non-Verbal Communication
Visual Signs in Non-Verbal Communication
Audio Signals in Non-Verbal Communication
Silence
Time
Touch
The Functions of Non-Verbal Communication
The Merits & Demerits of Non-Verbal Communication

**5. Verbal Skills** **4** Hr

Introduction
The Language used in Oral Communication
Verbal & Linguistic Modifiers & Regulators & Voice Culture
The Techniques of Delivery

**6. The Art of Listening** **4** Hr

Listening & Hearing
The Value of Listening
The Functions of Listening
The Pitfalls involved in Listening
The Process of Listening / The Principles of Listening
How to Listen Efficiently
The Barriers to Efficient Listening
The Types of Listening

**7. Body Language** **4** Hr

Introduction
The Types of Body Language
Facial Expressions
Kinesics Related To The Body
Touch

**8. How to conduct Oral Communication** **4** Hr

The Classification of Oral Communication
Dyadic Communication
Group Communication
Requests
Complaints
Inquiries
Introduction

Dictation
The Telephone
Interviews An Overview
At the Interview Venue

**9. The Essentials of Written Communication** **4** Hr

Introduction
Alignment
Font Style
Bold, Italics & Normal
Font Size
Indentation & Block Style
Items
Emphasis
Letter Heads
Continuation Sheets
Stationery
Presentation

**Reference Books:**

1. Communication Skills : Dr. Rao & Dr. Das- Himalaya Publishing House
2. Communication Skills : Dr. Urmila Rai, S.M. Rai – Himalaya Publishing house
3. Communication : By C.S. Rayadu - Himalaya Publishing House
4. Developing Communication Skills : Mohan Banerjee, Macmillan, India
5. Business Correspondance & report : R. C. Sharma, Krishna Mohan Writing- A Practical approach to Business & technical communication
6. Communication Skills for : Dr. Anjali Ghanekar, Everest Publishing

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| **Semester** | Second | | | | Teaching Hrs = 40 | |
| **Subject Code** | BCA – 242 | | | | Practice/Assignment Hrs = 20 | |
| **Subject Name** | **Advance Web Designing** | | | | Total Hrs :- 60 | |
| **Teaching Scheme** | | | **Examination Scheme** | | | **Credits** |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **4** |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

- Employ fundamental computational theory to basic programming techniques.
- Use fundamental skills to maintain web services required to host a website.
- Select and apply different mark up languages for processing, identifying and presenting of information in web pages.
- Use a scripting languages to transfer data and presenting of information in web pages.
- Create and manipulate web media objects using different software.
- Incorporate aesthetics and formal concepts of layout and organization to design websites that effectively communicate using visual elements.

**BCA – 242- Advanced Web Designing (HTML, JavaScript, VB Script)**

**Part I**

**1. HTML Basics** (3 Lectures)

Definition of HTML, Markup language, hypertext etc, ht ml tags-tag syntax. Structure of html document - head section and body section.

Block level elements Text level elements, Font tag, base font tag, big and small tags, bold italic and underline tags, the strike, teletype and BR tag, subscript and superscript tags, the quote tag.Heading tag and attributes, paragraph tag, center and block quote tags, hr tag the preformatted tag lists-ordered and unordered lists, definition lists.

**2.Images and colors-** (1 Lectures)

Background images and colors and their attributes.

**3.Hyperlinks & Table** (3 Lectures)

Anchor tag, h ref, title attribute, Table element, TR, TD, TH tags, caption elements, attributes of the table tag.

**4.Frames & Forms** (3 Lectures)

Creating frames-vertical, horizontal and grid of frames, attributes of the frameset element, frame tag and its attributes, linking frames.

The form tag-attributes- action, method the input elements and its types- text password checkboxes, radio buttons, submit and reset buttons, select tag, text area tag.

**Part II**

**1.Introduction to Java Script** (1 Lecture)

Origins of Java script, Java script characteristics, Common programming concepts Java & Java script, Server Side vs Client Side Application, Annotating Code with Comments

**2.Working with Variables & Data** (3 Lecture)
Communicating with the user, Variables Keyword and Reserved Words, Expression Operators, the on Load Event Handlers, Functions, Methods and Events, Defining Function, Calling a Function

**3. Controlling Programme Flow & The *do…….while* Statement** (2 Lectures)
The *if else* statement, the *while* statement, the *for* statement, the *break* statement, the *continue* statement, the *switch* statement

**4. The Java Script Object model** (2 Lecture)
The Java Script Object Hierarchy Model Commonly Used Objects, The window Object. The with statement, the document Object, the Image Object, The history Object, The location Object, The navigator Object

**5. Java Script Objects** (3Lectures)
Java Script Language Objects, The string Objects, string Objects Methods, Evaluating Strings, The Array Objects, The Date Time Objects, The Math Objects, The form Objects, The buttons Objects, The checkbox Objects, The Text & text area Objects, The radio button Objects, The select Objects, Form validation.

**Part III**
**1. Active Server Pages** (2 Lectures)
ASP Mechanics, What are ASP Features? Virtual Directories and ASP Applications ASP Delimiters, Starting Web Applications, How ASP page gets executed.

**Using VB Script**
Differences Bet. VB Script and Java Script, Declaring Variables with VB Script Program Flow

**2. ASP Intrinsic Objects** (5 Lectures)
Scripting Context, Server, Application, Sessions, Request, and Response Objects, error, Cookies

**3. Active X Data Objects** (2 Lecture)
Open Database Connectivity (ODBC) and Ole DB, Active X Data Objects, Registering Data Source names, global.asa

**Reference Books:**

- HTML by Xavier
- HTML – Black Book
- ASP in 24 hours
- ASP in 21 days
- HTML,DHTML, Java Script, CGI, Perl by Ivan Bayross
- Java Script- Tech media publication

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| **Semester** | Second | | | | Teaching Hrs = 40 | |
| **Subject Code** | 243 | | | | Practice/Assignment Hrs = 20 | |
| **Subject Name** | **Structured System Analysis and Design** | | | | Total Hrs :- 60 | |
| **Teaching Scheme** | | | **Examination Scheme** | | | **Credits** |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **4** |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

- Define and describe the five phases of the system development life cycle.
- Understand the expected benefits from systems projects.
- Explain the ways in which information systems support business requirements.
- Understand how systems analysts interact with users, management, and other information systems professionals.
- Develop data flow diagrams and decision tables.
- Perform a feasibility study.
- Evaluate systems development alternatives.
- Solve realistic systems analysis problems.

# **BCA-243- SSAD** Structured System Analysis and Design (34 lectures)

**1. System Concept and the information system environment ( 2 Lectures )**

System concept definition, Characteristics of system, Boundaries and interface, Open and closed system, Types of system

**2. Phases of Software Development Life Cycle ( 3 Lectures )**

What are problem, Feasibility study, analysis, design, implementation, and maintenance

**3. The role of System analyst ( 2 Lectures )**

Academic and professional qualifications, the multifaceted role of the analyst, Change agent, Investigation and monitoring, Architect, Psychologist, The analyst/ User Interface, MIS organization

**4. Different approaches to Software Development ( 2 Lectures )**

Waterfall model, Spiral Model, Prototyping, RAD, Object oriented

**5. Structured System Analysis Tools and Techniques ( 2 Lectures )**

Fact finding tools and techniques

Functional Decomposition Diagram (FDD)

**6. Application System Modeling ( 2 Lectures )**

ER model ( Data Modeling )

**Data Flow Diagram ( Process Modeling )**

**7. Database Design Methods ( 2 Lectures )**

Mapping ER diagram

Data Normalization techniques

**8. Logic representation techniques ( 2 Lectures )**

Decision trees, Decision tables, Structured English

**9. Input/output form design ( 3 Lectures )**

Input data, input media and devices, output design, form design, classification of form, form control

**10. System testing and quality assurance ( 4 Lectures )**

Nature of test data, test plan, system testing, quality assurance, audit trail

**11. Hardware and software selection ( 2 Lectures )**

Hardware suppliers, software suppliers, service suppliers, procedure for hardware and software selection

**12. Implantation and software maintenance ( 4 Lectures )**

Request for review, review plan, software maintenance, Maintenance procedure, reducing maintenance cost.

**13. Project scheduling and software ( 2 Lectures )**

Why do system fails, project management

**14. Security and Recovery of systems ( 2 Lectures )**

System security, Recovery planning

## Reference Books:


| | | |
|---|---|---|
| System Analysis and Design | - | V. Raja Raman |
| Introduction to system Analysis | - | Skidmore |
| Introduction to system Design | - | Skidmore |
| System Analysis and Design | - | Elias M. Awad |

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|---|---|---|---|---|---|---|
| **Semester** | Second | | | | Teaching Hrs = 26 | |
| **Subject Code** | BCA – 244 | | | | Practice/Assignment Hrs = 4 | |
| **Subject Name** | **PPM 1** | | | | Total Hrs :- 30 | |
| **Teaching Scheme** | | | **Examination Scheme** | | | **Credits** |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **2** |

**Course Outcomes (COs)**

**After learning this course student** Will be able to

- Discuss and communicate the management evolution and how it will affect future managers.
- Evaluate leadership styles to anticipate the consequences of each leadership style.
- Observe and evaluate the influence of historical forces on the current practice of management.
- Identify and evaluate social responsibility and ethical issues involved in business situations and logically articulate own position on such issues.
- Explain how organizations adapt to an uncertain environment and identify techniques managers use to influence and control the internal environment.
- Practice the process of management's four functions: planning, organizing, leading, and controlling.
- Gather and analyze both qualitative and quantitative information to isolate issues and formulate best control methods.

# BCA-244- Principles and Practice of Management (PPM 1) (35Lectures)

**Nature of management : ( 6 Lectures)**

a. Meaning , Definition
b. Nature of mgmt.
c. Importance of mgmt.
d. Functions of mgmt.
e. Management as an art , a science and a profession
f. Distinguish between management, organization and administration

**2. Evolution of Mgmt. thought : ( 6 Lectures)**

a. Contribution of F.W.Taylor
b. Contribution of Henry Fayol
c. Contribution of Elten Mayo
d. Various approaches to management

**3. Planning : ( 6 Lectures)**

a. Meaning, definitions
b. Nature , objectives
c. Importance
d. Process of planning
e. Types of plans
f. Advantages

g. Disadvantages

**4. Forecasting: ( 5 Lectures)**

a. Meaning
b. Methods
c. Techniques
d. Sales forecasting:
   a. methods of sales forecasting
e. advantages

**5. Decision making: ( 6 Lectures)**

a. Meaning and definitions
b. Types of decisions
c. Process of decision making

**6. Organizing: ( 6 Lectures)**

a. Meaning and definitions
b. Importance of organizing
c. Features of organizational structure
d. Types of organization:
   a. Line
   b. Line and staff
   c. Functional
   d. Committee
e. Departmentalization
f. Span of management
g. Delegation of authority
h. Centralization and decentralization

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|---|---|---|
| **Semester** | Second | Teaching Hrs = 26 |
| **Subject Code** | BCA – 245 | Practice/Assignment Hrs = 4 |
| **Subject Name** | **Cyber Security Level – I** | Total Hrs :- 30 |

| **Teaching Scheme** | | | **Examination Scheme** | | | **Credits** |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **2** |

**Course Outcomes (COs)**

**After learning this course student** Will be able to

- Evaluate the computer network and information security needs in an organization.
- Assess cyber security risk management policies in order to protect an organization's critical information and assets.
- Measure the performance of security systems within an enterprise-level information system.
- Troubleshoot, maintain and update an enterprise-level information security system.
- Implement continuous network monitoring and provide real-time security solutions.
- Formulate, update and communicate short- and long-term organizational cyber security strategies and policies.

# BCA-245 Cyber Security Level – I (35 Lecture)

**CHAPTER 1- INTRODUCTION TO NETWORKING** (3 Lecture)

1.1 TYPES OF NETWORK CONFIGURATION
1.1.1 Peer-to-peer networks
1.1.2 Client/server networks
1.2 NETWORK TRANSMISSION TECHNOLOGIES
Broadcast network, Point – to- point network
1.3 TYPES OF NETWORK
1.3.1 Local area networks
1.3.2 Metropolitan area networks
1.3.3 Wide area networks
1.4 BASIC TYPES OF TOPOLOGIES
Star, Ring, Mesh, Tree, Hybrid
1.4.1 Physical Topologies,
1.4.2 Classification of Physical Topologies:
Linear Bus, Distributed Bus, Extended Star, Distributed Star, Dual-ring, Hierarchical Star, Star-wired Ring, Hybrid Mesh
1.5 NETWORK HARDWARE COMPONENTS
1.5.1 Network Interface Cards
Network Interface Cards (NICs), Bridges, Hubs, Switches, Routers
1.5.2 Cabling The OSI Reference Model

OSI Layer 1: The Physical Layer, OSI Layer 2: The Data Link Layer, OSI Layer 3: The Network Layer, OSI Layer 4: The Transport Layer, OSI Layer 5: The Session Layer, OSI Layers 6: The Presentation Layers, OSI Layers 7: The Application Layer

1.6 THE TCP/IP REFERENCE MODEL

The Internet Layer, The Transport Layer

1.7 PROTOCOLS AND NETWORKS IN THE TCP/IP MODEL INITIALLY

1.7.1 The Application Layer

1.7.2 The Host-to-Network Layer

1.8 IP ADDRESS CLASSES AND STRUCTURE

1.8.1 Understanding the Classes

1.8.2 Introducing Network ID and Node ID concepts

1.8.3 The Network and Node ID of each Class

1.8.4 What is Subnetting?

1.8.5 Understanding the concept

1.8.6 Subnetting Analysis

Understanding the use, and analysing different subnet masks, Common Subnet Masks

**CHAPTER 2-INTRODUCTION TO CYBER SECURITY AND ETHICAL HACKING** (3 Lecture)

2.1 WHY IS CYBER SECURITY A PROBLEM?

2.2 WHAT IS HACKING?

2.2.1 Who are Hackers?

2.2.2 What is Ethical Hacking?

2.2.3 Who are Ethical Hackers?

2.2.4 Who are crackers?

2.2.5 Hacker Vs Crackers

Features of Hackers, Features of Crackers

2.2.6 Classes of Hackers

Black Hat hacker, White Hat hackers, Grey hat hackers

2.3 ESSENTIAL TERMINOLOGY USED IN HACKING

2.4 WHAT DOES A MALICIOUS HACKER / CRACKERS DO?

2.5 WHAT DO ETHICAL HACKERS DO?

2.6 TYPES OF ATTACKS

2.6.1 Non-Technical Attacks

2.6.1.1 Bribery

2.6.1.2 Social Engineering

2.6.1.3 Shoulder Surfing

2.6.1.4 Dumpster Diving

2.6.2 Technical attacks

2.6.2.1 Network Infrastructure Attacks

2.6.2.2 Operating System Attacks

2.6.2.3 Application and Other Specialized Attacks

2.7 HACKTIVISM

2.8 COMPUTER CRIMES AND IMPLICATIONS

2.9 TYPES OF CYBER CRIME

2.10 INDIAN IT ACT 2000

AMENDS, RECOGNIZES ELECTRONIC EVIDENCE, JURISDICTION

SECTION 65: SOURCE CODE, SECTION 66: HACKING, SECTION 67: PORNOGRAPHY

WHAT IS SOCIAL ENGINEERING?

2.11 WHAT IS SOCIAL ENGINEERING?
2.11.1 Art of Manipulation
2.11.2 Human Weakness
2.11.3 Common Types of Social Engineering
2.11.4 Human based - Impersonation
2.11.5 Dumpster Diving
2.11.6 Shoulder Surfing
2.11.7 Computer Based Social Engineering
2.11.8 Reverse Social Engineering
2.11.9 Policies and Procedures

**CHAPTER 3 – FOOTPRINTING** (3 Lecture)
3.1 STEPS FOR GATHERING INFORMATION
3.2 SOME UTILITIES AND TECHNIQUES ARE:
3.2.1 Some Utilities and Techniques are:
Physical Ports like, Virtual Ports, Some software like:
3.3 THE SOFTWARE AND UTILITIES ARE
Nmap, Port Scan, Shadow Scan etc.
3.4 UNEARTHING INITIAL INFORMATION
Domain name lookup, Locations, Contacts (Telephone /mail), open source, Whois, Nslookup
3.5 What Is WHOIS?
A directory service, Protocol and application, Client/Server based, InterNIC and DDN (Defense Data Network) directories, Other WHOIS directories
3.5.1 WHOIS actually refers to three things:
3.5.2 WHOIS is used:
3.5.3 WHOIS can be accessed in a number of ways:
3.5.4 The WHOIS Command
3.6 NSLOOKUP
3.7 USING SAM SPADE
3.7.1 Basics Configuration
3.7.2 Header analysis
3.7.3 More advanced tools
3.8 ARIN
3.9 TRACEROUTE
3.10 NEOTRACE PRO
3.11 TOOL: VISUALROUTE TRACE
3.11.1 Running VisualRoute
3.12 TOOL: SMARTWHOIS
3.13 TOOL: CALLERIP
3.14 TOOL: MAIL TRACKING (MAILTRACKING.COM)
3.15 SUMMARY SCANNING
3.16 OBJECTIVES OF SCANNING:
3.17 SCANNING IS DONE TO DETECT LIVE SYSTEM ON THE TARGETNETWORK TO:
3.18 TOOLS USED:
3.18.1 War Dialers
3.18.1.1 Tool: THC Scan
3.18.2 Ping
3.18.2.1 Detecting Ping Sweeps

5.4.2.2 Countermeasures
5.4.3 Shoulder surfing
5.4.3.1 Techniques
5.4.3.2 Countermeasures
5.5 INFERENCE
5.5.1 Weak authentication
5.5.2 Bypassing authentication
5.5.3 Countermeasures
5.6 HIGH-TECH PASSWORD CRACKING
5.7 PASSWORD CRACKING SOFTWARE
5.8 WINDOWS USUALLY STORES PASSWORDS IN THESE LOCATIONS:
5.9 LINUX AND OTHER UNIX VARIANTS TYPICALLY STORE PASSWORDS IN THESE FILES:
5.10 DICTIONARY ATTACKS
5.11 BRUTE-FORCE ATTACKS
5.12 CRACKING PASSWORD WITH LOPTH CRACK
5.13 OBTAINING THE PASSWORD HASHES
5.14 GENERAL PASSWORD-HACKING COUNTERMEASURES
5.14.1 Storing passwords
5.14.2 Policy considerations
5.15 LINUX VULNERABILITIES
5.15.1 Information Gathering
5.15.2 System scanning
5.15.3 Countermeasures
5.15.4 Searches
5.15.5 Vulnerabilities
5.16 TOOLS
5.16.1 Countermeasures
5.17 UNIX/LINUX
5.17.1 Physical Security
5.17.2 Hacks
5.17.3 Countermeasures
5.17.4 Patching Linux
5.18.5 Distribution updates
5.18.5.1 Red Hat
5.18.5.2 Debian
5.18.5.3 Slackware
5.19 SUSE/NOVELL
5.19.1 Mitigating SAM and SysKey Cracking

**CHAPTER 6 APPLICATION ATTACKS** (3 Lecture)

6.1 PASSWORD-PROTECTED FILES
6.1.1 Countermeasures
6.2 OTHER WAYS TO CRACK PASSWORDS
6.2.1 Keystroke logging
6.2.2 Logging tools
6.2.3 Countermeasures
6.2.3.1 Weak password storage
6.2.3.2 Searching

6.2.3.3 Countermeasures

**CHAPTER 7 – MALWARES** (3 Lecture)

7.1 IMPLICATIONS OF MALWARE ATTACKS
7.2 TYPES OF MALWARE
7.2.1 Trojan horses
7.2.2 Spyware
7.2.3 Security tools
7.3 HACKING TOOL: QAZ
7.4 HACKING TOOL: NETCAT
7.5 HACKING TOOL: SUB SEVEN
7.6 HACKING TOOL: DONALD DICK
7.7 HACKING TOOL: NETBUS
7.8 VARIOUS DEADLY VIRUSES
7.9 INDICATIONS OF INFECTION
7.10 HOW MALWARE PROPAGATES
7.11 MALWARE COUNTERMEASURES

**CHAPTER 8 - NETWORK BASED ATTACKS** (3 Lecture)

8.1 DENIAL OF SERVICE
8.1.1 What is Denial of Service Attack?
8.2 TYPES OF DOS ATTACKS
8.2.1 Ping of Death
8.2.2 Teardrop
8.2.3 SYN Attack
8.2.4 Land Attack
8.2.5 Smurf Attack
8.3 HOW DOS WORKS?
8.4 WHAT IS DDOS?
8.5 HACKING TOOL: PING OF DEATH
8.6 TOOLS FOR RUNNING DDOS ATTACKS
8.7 SESSION HIJACKING
8.7.1 What is Session Hijacking?
8.8 SNIFFERS
8.9 TOOLS USED FOR SNIFFING:
8.9.1 Tool: Ethereal
8.9.2 Tool: Snort
8.9.3 Tool: Windump
8.9.4 Tool: Etherpeek
8.9.5 EtherFlood
8.9.6 Dsniff
8.9.7 ARP Spoofing
8.9.8 Sniffing HTTPS and SSH
8.9.9 Man in the Middle Attack
8.9.10 Ettercap
8.9.11 SMAC
8.9.12 Mac Changer
8.9.13 Iris
8.9.14 DNS Sniffing and Spoofing
8.9.15 WinDNSSpoof

**CHAPTER 9- CRYPTOGRAPHY WITH DIFFERENT APPLICATIONS** (3 Lecture)

9.1 INTRODUCTION TO CRYPTOGRAPHY
9.1.1 What is PKI?
9.2 RSA (RIVEST SHAMIR ADLEMAN)
9.2.1 Setting up RSA
9.3 MD5
9.4 SHA (SECURE HASH ALGORITHM)
9.4.1 What is SSH?
9.4.2 Hacking Tool: PGP Crack
9.5 STEGANOGRAPHY
9.5.1 Tool: Mp3Stego

**CHAPTER 10 – IDS & FIREWALLS** (3 Lecture)

10.1 INTRUSION DETECTION SYSTEMS (IDS)
10.2 SYSTEM INTEGRITY VERIFIERS (SIV)
10.3 HOW DOES IDS MATCH SIGNATURES WITH INCOMING TRAFFIC?
10.4 EVADING IDS SYSTEMS
10.4.1 Complex IDS Evasion
10.5 HACKING TOOL:
10.5.1 Fragrouter
10.5.2 Hacking Tool: Tcpreplay
10.5.3 Hacking Tool: SideStep.exe
10.5.4 Hacking Tool: Anzen NIDSbench
10.5.5 Hacking Tool: ADMutate
10.5.6 Hacking through firewalls
10.5.7 Bypassing Firewall using Httptunnel
10.6 PLACING BACKDOORS THROUGH FIREWALLS
10.6.1 The reverse www shell
10.6.2 Hiding behind Covert Channel: Loki
10.7 HACKING TOOL:
10.7.1 007 Shell
10.7.2 Hacking Tool: ICMP Shell
10.7.3 ACK Tunneling
10.8 WHAT IS A HONEYPOT?
10.8.1 Advantages of Honeypots
10.8.2 DISADVANTAGES OF HONEYPOTS
10.8.3 TYPES OF HONEYPOTS
10.8.4 Low-Interaction Honeypots
10.8.5 High-Interaction Honeypots
10.8.6 Honeypot Software Vendors
10.8.7 Honeypot-KFSensor

**CHAPTERS 11- REVERSE ENGINEERING** (3 Lecture)

11.1 REVERSE ENGINEERING
11.2 REVERSE ENGINEERING AND OTHER TYPES OF ENGINEERING
11.3 STAGES INVOLVED IN THE REVERSE ENGINEERING PROCESS
11.4 DISASSEMBLY OR DECOMPILATION
11.5 SOURCE CODE AND OBJECT CODE
11.6 USES OF REVERSE ENGINEERING
11.7 REVERSE ENGINEERING
11.7.1 HOW TO CRACK ANY TYPE OF SOFTWARE PROTECTION

11.7.2 TOOL: HEX WORKSHOP

| Semester | Second | | | | Teaching Hrs = 26 | |
|---|---|---|---|---|---|---|
| Subject Code | BCA – 246 | | | | Practice/Assignment Hrs = 4 | |
| Subject Name | PC Maintenance | | | | Total Hrs :- 30 | |
| Teaching Scheme | | | Examination Scheme | | | Credits |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 2 |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

- Explain how a PC works, and understand the relationship between hardware and software.
- Classify and explain the function of different computer hardware components.
- Understand purpose and functions of an operating system (OS).
- Understand the purpose and functions of the computer peripherals.
- Understand diagnostic procedures and troubleshooting techniques to personal computers, portable devices, operating systems and computer peripherals.
- Install, configure, optimize and upgrade personal computers.
- Install, configure, optimize and upgrade the portable computers.
- Install, configure, optimize and upgrade the operating system

## Computer Hardware and PC Maintenance Syllabus

Chapter -1 Introduction to Personal Computer

Block Diagram of PC. Function of each block. What is Hardware? What is software? Types of Software - system software- BIOS and Operating system and Application software. What is Data? Brief history of PC technology. Components of PC.

Chapter -2 Motherboards , I/O Slots, Expansion Slots, Buses

Types of Motherboards, Form Factors, Components of motherboards, Chipsets, Northbridge Southbridge, Memory slots, External cache memory , Processor sockets, Integrated I/O ports, Computer BUS, Expansion bus slots, CPU Architectures and Modes of Operations, Modes of Operation, Hyper Threading Technology.

Chapter -3 Processor, Sockets ,Slots and BUS architecture

Function of CPU Socket, Types of CPU Sockets, Installation of CPU on Motherboard, Processors, Characteristics of Processors, How a CPU Works, Intel i3, i5 and i7 Processors, BUS Architecture, CPU FSB, 32-Bit versus 64-Bit Bus, Memory BUS, Expansion bus slots

Chapter -4 BIOS and Cache Memory

BIOS/firmware, Sample Beep codes, POST and Features of BIOS/Firmware, Plug & Play BIOS, Flash BIOS Upgradation, Cache Memory, Cache miss, Cache Hit

Chapter -5 Memory Management

Primary Memory, Logical Memory, Organization of conventional memory - Extended and Expanded memory, Overview and features of SDRAM, DDR, DDR2 and DDR3 RAM, Error Checking Memory, (ECC RAM), Parity RAM non-parity RAM, Logical, Extended and expanded memory.

Chapter-6 Storage Devices

Floppy Disk Drives, Disk Controllers, Hard Disk Controller (HDC), Hard Disk Drives, Types of Drive Interfaces, Parallel ATA (PATA) and Serial ATA (SATA) comparison, Difference between SATA I, SATA II and SATA III, SCSI Controllers, SAS Technology, Managing disks, Basic disks, Disk Partition, Benefits of multiple partitions, Disadvantages of multiple partitions, Types of partitions, Dynamic disks, File systems, *FAT, FAT32*, NTFS (New Technology File System), File extensions, File attributes, Optical Media Storages, Compact Disc (CD), BD vs. DVD.

Chapter-7 Display Devices

Types of Display Devices, Video technologies, The Monitor, Working of CRT Monitor, LCD Monitors, Projectors, The Technical Differences between LCD and DLP, How DLP Projectors Work, The Advantages of DLP Technology, Disadvantages to DLP Projectors, How LCD Projectors Work, The Advantages of LCD Technology, The Weaknesses of LCD Technology, How LED Projectors Work, The Advantages and Disadvantages to LED Projectors, Wireless projector capabilities, The advantages of wireless projectors, Types of wireless projectors, Security of wireless projectors

Chapter -8 Input Output Devices

Types of I/O devices, The Keyboard, Internal Working of the Keyboards, Different types of computer keyboards, Ergonomic Keyboard, Personal System (PS/2) Keyboard, Mini PS/2 Keyboard, Multimedia Keyboard, Internet Keyboard, Wireless Keyboard, Gaming Keyboard, Mouse, Inside of a Mouse, How does a mouse actually work? Inside an optical mouse, How an optical mouse works, Mouse Interface Types, Pointing devices, Trackball, Touchpoint, Touchpad, Touch Screen, Printers & Scanners, Characteristics and Capabilities of Printers, Impact printers, Inkjet Printers, Thermal Printers, Laser Printers, Scanners, 1 All-in-One Devices Flatbed Scanners, Handheld Scanners, Drum Scanners, Bar Code Scanners, Fingerprint scanner, Modems, broadband modems, How broadband Internet works?

Chapter - 9 Power Supply and UPS

The Power Supply (SMPS), Power Supply Connectors, Table 1-1 Power Color Codes, Different connectors, Hot Swap Power Supply, Power supply problems, Power Protection Devices, Surge suppressor, Uninterruptible power supply (UPS), Online and Offline UPS, Standby power supply (SPS), The Main Power Problems, Surge / Spike, Line Noise, Brownout / Under voltage/ Sag, Swell / Overvoltage, Blackout / Power Outage, The Solution for power Problems.

Chapter -10 I/O Ports, Cables, NICs, Wi-Fi and Bluetooth

Use of I/O ports, Serial ports & Cables, USB Ports and Cables, USB 3.0 Highlights and Benefits over USB 2.0, FireWire Ports and Cables, Parallel Ports and Cables, SCSI Ports and Cables, PS/2 Ports, Audio Ports, Video Ports and Connectors, Network Interface Card, Types of Network Interfaces, Wireless or Wi-Fi Ethernet, Working of Wireless Networks, Examples of Wi-Fi Devices, Examples Of Wireless Networks, Wi-Fi Ethernet Standards, IEEE 802.15(Bluetooth)
Interrupt Request Lines

Chapter -11 Computer Maintenance

POST and its sequence, Preventive Maintenance, *Passive* preventive maintenance, An *active* preventive maintenance, Hardware Maintenance, Software Maintenance, Active Preventive Maintenance Procedures, Basic diagnostic procedures, Basic troubleshooting tools, screwdrivers, Long nose pliers, Flashlight, Soldering iron, Wire strippers, Multimeter, Crimping Tool, Software tools and utilities, Bootable disks, Power-On Self-Test, Hard Drive Self-Test, Software diagnostic tools, Identifying problems, Preventive Maintenance (PM) in Depth, Laptop Preventive Maintenance (PM), Computer Virus, What is Antivirus?, Software Preventive maintenance procedures, Security policies.

Chapter - 12 Basics of an Operating System

What is an Operating System? Its functions, Desktop operating System, Network Operating system, Modes of operation, Windows 7 Editions, Windows 7 Hardware Requirements, Windows 7 Installation Procedure, Windows 8.1 Editions, Minimum Hardware for common resources, Windows 8.1 Installation Methods

| | | | | | | |
|---|---|---|---|---|---|---|
| **Semester** | Second | | | | Teaching Hrs = 40 | |
| **Subject Code** | BCA – 247 | | | | Practice/Assignment Hrs = 20 | |
| **Subject Name** | **Operating System** | | | | Total Hrs :- 60 | |
| **Teaching Scheme** | | | **Examination Scheme** | | | **Credits** |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **4** |

**Course Outcomes (COs)**

**After learning this course student** Will be able to

- Master functions, structures and history of operating systems
- Master understanding of design issues related to operating systems
- Master various process management concepts including scheduling, synchronization, deadlocks
- Master system resources sharing among the users
- Master concepts of memory management including virtual memory.
- Be familiar with multithreading
- Master issues related to file system interface and implementation, disk management
- Be familiar with various types of operating systems including Unix

BCA – 247 Operating System (35 Lectures)

**UNIT 1 -**Basics of Operating systems. (7 Lectures)
Definition, functions of operating systems. Computer processing techniques - batch processing spooling.(DELETE) Multiprogramming, multiprocessing, time-sharing, online processing, real time processing. Typical operating systems - Dos, Window.
Types of windows and its basic features

**UNIT 2 -** Introduction to I/O PROGRAMMING (8 Lectures)
INTERRUPT PROGRAMMING, MACHINE STRUCTURE: Assembly Language Programming, I/O programming, Interrupt Structure and Processing, Examples of I/O and Interrupt Processing Programs.

**UNIT 3 -** PROCESSOR MANAGEMENT: (10 Lectures)

Introduction to State Model(page no. 81, OS,Silberschatz) Job Scheduling, Process Scheduling, Multiprocessor Systems, Process Synchronization.

DEVICE MANAGEMENT:

Introduction to Techniques for Device Management, Device Characteristics – Hardware Consideration, Channels and Control Units, Device Allocation Considerations, Virtual Devices, I/O Programming, Interrupt Structure and Processing.

MEMORY MANAGEMENT:

Introduction to Single Contiguous Allocation, Introduction to Multiprogramming, Partitioned Allocation, Relocation Partitioned Memory Management, Paged Memory Management, Demand – Paged Memory

Management, Segmented Memory Management, Segmented and Demand – Paged Memory Management, Other Memory Management, Future Trends in Memory Management.

INFORMATION MANAGEMENT:

Introduction to a Simple File System, General Model of a file System, Symbolic File System, Basic File System, Access Control Verification, Logical File System, Physical File System, Device Strategy Module.

**UNIT 4** (10 Lectures)

DESIGN OF A SAMPLE OPERATING SYSTEM:

Overview of the System, Design Overview, Levels and Layers of the Sample Operating System, Nucleus Databases and Routines, Processor Management Databases and Routines, Memory Management Databases, Device Management Databases, Device Management Routines and Processes, Supervisor Routine and Process, User Programs and Processes, Partial Trace of SVC Flow.

INTERDEPENDENCIES: PERFOMANCE EVALUATION

Memory Management, Processor Management, Device Management, Information Management, Influences, Swapping versus Paging, Thrashing.

# TILAK MAHARASHTRA VIDYAPEETH

## BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEM:III

| | | |
|---|---|---|
| **Semester** | Third | Teaching Hrs = 40 |
| **Subject Code** | BCA - 341 | Practice/Assignment Hrs = 20 |
| **Subject Name** | C++ | Total Hrs :- 60 |

| Teaching Scheme | | | Examination Scheme | | | Credits |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **4** |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

* Develop knowledge of Advance version of language C with classes and objects
* Differentiate between object oriented programming and procedural oriented language and data types in C++.
* Simulate the problem in the subjects like Operating system, Computer networks and real world problems.
* Develop knowledge of program using C++ features such as composition of objects, Operator overloading, inheritance, Polymorphism etc.

## C++

Total Lectures: 35 Hr

**INTRODUCTION** (3 Hours)

C++ programming Basic

Object Oriented programming, Characteristics, Advantages of object Oriented programming over procedural language.

**INTRODUCTION TO C++, EXTENSION OF C** (4 Hours)

Data types, constants, references, Variable, Loops and decisions

Arrays, strings and Structures Revision

Classes and objects

**INTRODUCTION TO C++ CLASSES:** (5 Hours)

Data Members, Functions, Scope resolution operator,

Access specifier

New, delete operator, Static members.

**CONSTRUCTOR and DESTRUCTOR** (3Hours)

Encapsulation, Inline functions, and default parameters

Pointers and '*This*' pointer

**OVERLOADING:** (6Hours)
Function Overloading, Operator Overloading
Default Arguments

**1st Unit test at end of above topics (after 1.5 to 2.5 months)**

**INHERITANCE:** (4 Hours)
Base class, derived class, Virtual Class, Abstract class.

**POLYMORPHISM** (4 Hours)
Virtual functions, Pure Virtual functions and abstraction
Function Overloading and ambiguities
All remaining types of functions

**STREAM CLASS, FILE INPUT/OUTPUT.** (3 Hours)
FStream classes, working with files with functions for reading and writing

**EXCEPTION HANDLING.** (3 Hours)
Fundamental, Multiple catch statements, catching all exception
Templates concept

Revision and completion of all theory and practical assignments

**Reference Books:**
The complete reference - Herbert Schildt
Object Oriented Programming in C++ - Robert Lafore

| | | | | | | |
|---|---|---|---|---|---|---|
| **Semester** | **Third** | | | | **Teaching Hrs = 40** | |
| **Subject Code** | **BCA - 342** | | | | **Practice/Assignment Hrs = 20** | |
| **Subject Name** | **DBMS** | | | | **Total Hrs :- 60** | |
| Teaching Scheme | | | Examination Scheme | | | Credits |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 4 |

Course Outcomes (COs)

After learning this course student will be able to,

* Gain a good understanding of the architecture and functioning of database management systems as well as associated tools and techniques,
* Understand the use of structured query language and its syntax, transactions, database recovery and techniques for query optimization.
* Develop learning of management of data in the system
* Acquire a good understanding of database systems concepts and to be in a position to use and design databases for different applications.

## BCA – 342 Database Management System (DBMS) (40 Lecture)

**1.0 Objectives** (4 Lecture)

1.1 Storage devices characters

1.2 File Organization

Sequential Files, Indexing and methods of indexing, Hash files

**2: Introduction To Database Systems** (4 Lecture)

2.0 Objective

2.1 Introduction to DBMS

- 2.1.1 What is Data, Database system, DBMS?
- 2.1.2 Single and Multi-user systems
- 2.1.2 Advantages and drawbacks of DBMS
- 2.1.3 Architecture of DBMS
- 2.1.4 Users of DBMS
- 2.1.5 Roll of Database Administrator

2.2 Components of DBMS

2.3 Types of DBMS - Hierarchical, Network, Relational

2.4 Why RDBMS?

2.5 Features of RDBMS

2.6 Attributes, tuples & tables, codd's rules

**3: Entity Relationship Model** (4 Lecture)

3.0 Objectives

3.1 Entity Relationship Model

- 3.1.1 Entity set
- 3.1.2 Relationship set
- 3.1.3 Attributes and values.

3.2 Weak and Strong Entity

3.3 Keys in DBMS
3.4 Conventions for drawing ERD
3.5 Abstraction
3.6 Generalization

**4: DBMS Concepts** (4 Lecture)
4.0 Objectives
4.1 ACID Properties
4.2 Concurrency Control
4.3 Recovery Mechanisms
4.4 Views And Security
4.5 Integrity Constraints
4.6 Data Security

**5: Relational Database Design** (4 Lecture)
5.0 Objectives
5.1 Need For Proper Database
5.2 Undesirable Properties Of Bad Database Design
5.3 Functional Dependencies
5.4 Normalization Using FDS - 1 NF, 2 NF, 3 NF, BCNF
5.5 Properties Of Decomposition - Loss less Join, Dependency Preserving

**6: SQL Relational Database Design** (4 Lecture)
6.0 Objectives
6.1 Introduction
6.2 DDL
6.3 DML
6.4 DCL
6.5 Simple Queries

**7: Security** (4 Lecture)
7.0 Objectives
7.1 Granting access to users
7.2 Extending and restricting privileges
7.3 Using views of security

**8:Transaction Processing** (4 Lecture)
8.0 Objectives
8.1 Transaction, transaction processing
8.2 Properties of Transaction
8.3 Schedules
8.4 Serializing and its need

**9 :Backup and Recovery** (4 Lecture)
9.0 Objectives
9.1 Types of failure and storage systems
9.2 Need for backup and recovery

**10: Concurrency Control & Recovery Techniques** (4 Lecture)
10.0 Objectives

10.1 Concurrency problems
10.2 Concurrency control mechanisms
10.3 Deadlocks
10.4 Deadlocks handling detection and prevention

**11: Introduction To Data Warehousing And Data Mining** (4 Lecture)
11.0 Objectives
11.1 Data Warehousing & Data Mining

| | | |
|---|---|---|
| **Semester** | **Third** | **Teaching Hrs = 40** |
| **Subject Code** | **BCA - 343** | **Practice/Assignment Hrs = 20** |
| **Subject Name** | **VB.Net** | **Total Hrs :- 60** |

| Teaching Scheme | | | Examination Scheme | | | Credits |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 4 |

Course Outcomes (COs)

After learning this course student Will be able to

- Understand .NET Framework and describe some of the major enhancements to the new version of Visual Basic.
- Describe the basic structure of a Visual Basic.NET project and use main features of the integrated development environment (IDE)
- Create applications using Microsoft Windows® Forms
- Create applications that use ADO. NET
- Use Crystal Reports

**BCA 34 - VB.NET**

* .Net Fundamentals: Introduction to .NET Framework, Distributed Architecture and .NET, .NET Common Language Runtime, Introduction to XML, SOAP protocols. 4 L

* VB.Net Introduction to VB.Net with overview of .NET Framework: VB.NET Vs VB 6.0, what can be done with VB.NET, Windows application, Windows Controls, ASP.NET Projects, Web Services, .NET Components
  4 L

* VB.NET Language Essentials: Data Types, Operators, Control Statements, arrays, jagged array, Property.
  4 L

* Object Oriented Programming Overview: Object Oriented Programming Concept, Classes & Objects, Type by Val, Type byRef, Inheritance, Abstract Classes & Interfaces.
  4 L

* Developing Windows Applications: Win Forms, GUI Controls – Properties & Methods, MDI Forms, Inheritance Picker, Message Handling, Common Dialog Boxes, Common Controls.
  4 L

* Structured error Handling: Exception – try – catch – finally – End try block, Nested Exception, Throwing Exception, User defined exception 4 L

* Com object, interoperability: Com Model in .Net framework, Interoperability with VB-6.0 Com objects. 4 L

* File Stream: Memory Stream, File Stream, Buffered Stream, Binary Readers, writers, Stream reader writers,
4 L

* Collection, Array list, hash table, sorted list and examples of stack and queue.

4 L

* ADO.NET: Database Connectivity.(Take SQL Server as database) Connected , disconnected architecture, properties of dataset, reader, adapter etc. 4 L

| | | |
|---|---|---|
| **Semester** | **Third** | **Teaching Hrs = 26** |
| **Subject Code** | **BCA - 344** | **Practice/Assignment Hrs = 4** |
| **Subject Name** | **ECOMMERCE** | **Total Hrs :- 30** |

| Teaching Scheme | | | Examination Scheme | | | Credits |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 2 |

Course Outcomes (COs)

After learning this course student will be able to,

* Demonstrate an understanding of the foundations and importance of E-commerce
* Analyze the impact of E-commerce on business models and strategy
* Describe Internet trading relationships including Business to Consumer, Business-to-Business, Intra-organizational.
* Analyze different types of portal technologies and deployment methodologies commonly used in the industry.
* Integrate theoretical frameworks with business strategies.

## BCA –344 E-Commerce (40 Lectures)

**I Basic web commerce concepts**, **electronic commerce modes:** **(6Hr)**

Overview, EDI, electronic commerce with www-internet, commerce net advocacy.

**II Approach to safe E-commerce**:- **(6 Hr)**

Secure transport protocol and transaction, SEPP, SET, certificate for authentication, security on web server and enterprise network.

**III Electronic cash and Electronic payment scheme:** Internet **(8 Hr)**

monetary payment and security requirements; Payment & purchase order process, Online Electronic cash.

**IV Internet/Intranet Security issues and solutions:** **(8 Hr)**

Needs for computer security, security strategies, Encryption.

MasterCard/visa secure Electronic Transaction: Introduction requirements and concepts, payment processing.

**V Internet & web site Establishment: (8 Hr)**

Internet Resources for commerce: introduction, Web server Technologies, internet tools Relevant to commerce, internet applications for commerce.

**VI Law related to IT ACT , (4 Hr)**

Mobile and wireless computing fundamentals.

**Reference Book :**Daniel Minoli & Emma Minoli : Web Commerce Technology Hand Book Martyn Mallick : Mobile & wireless design essentials

# TILAK MAHARASHTRA VIDYAPEETH

## BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEM:IV

| | | |
|---|---|---|
| Semester | Fourth | Teaching Hrs = 40 |
| Subject Code | BCA - 441 | Practice/Assignment Hrs = 20 |
| Subject Name | Java | Total Hrs :- 60 |

| Teaching Scheme | | | Examination Scheme | | | Credits |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 4 |

Course Outcomes (COs)

After learning this course student Will be able to

2. Understand and implement object oriented concepts using java
3. Have knowledge of the structure and model of the Java programming language
4. Use Java programming language for various programming technologies
5. Develop software in the Java programming language.
6. evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements

BCA – 441 - Java

**1. The Genesis of Java** **2Hr**

Creation of Java, Why it is important to Internet, characteristics of Java

**2. Basics of Programming** **4Hr**

Data types and variables, Arrays operators Types casting and conversion Condition & looping constructs Clauses and methods Overloading Inheritance

**3. Packages & Interfaces** **5Hr**

Defining Packages, Understanding & catch class path Access protection, Importing Packages, interfaces

4. Exception Handling 4Hr

Exception types ,Using try & catch, Nested try, Using throw , throws finally Built in Exception, Creating & using own Exception ,Subclasses

**5. String Handling** **4Hr**

String constructions, String operations, Standard String methods

**6. Multithreading** **5Hr**

Thread Life Cycle, Thread's priorities, synchronization, runnable interface, IsAlive() & Join().Deadlock

**7. I/O** **6Hr**

Streams, byte Streams, Char Streams, Reading console I/P, Writing Console O/P file I/O, sterilization

**8. Applet Programming** **6Hr**

Applet basics, Simple display methods. Repainting passing parameters

**9. Event Handling** **6Hr**

Event Classes, Sources of Events, Event listeners

*10. User Interface* *6Hr*

AWT classes Windows fundamentals, Component-window, Container-frame

Panel –canvas Checkbox, group list scrollbar
Graphics Text field, text area
Colors Menus dialogs.
Fonts AWT-controls-layout manager
Labels
Buttons

**11. Introduction to Swings** **2Hr**

Japplet, Icons, Labels, Text fields, Button, Combo Box, Tabbed panes, Scroll Panes, Trees, Tables

**Reference Books:**

- Java - Complete reference
- Java - O'reilly
- Java Black Book

| | | | | | | |
|---|---|---|---|---|---|---|
| Semester | Fourth | | | | Teaching Hrs = 26 | |
| Subject Code | BCA - 442 | | | | Practice/Assignment Hrs = 4 | |
| Subject Name | Business Applications | | | | Total Hrs :- 30 | |
| Teaching Scheme | | | Examination Scheme | | | Credits |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 4 |

Course Outcomes (COs)

After learning this course student will be able to,

* Gain familiarity with the concepts and terminology used in the development, implementation and operation of business computer applications.
* Explore various methods where Information Technology can be used to support existing businesses and strategies.
* Investigate emerging technology in shaping new processes, strategies and business models.
* Achieve hands-on experience with productivity/application software to enhance business activities
* Study of this subject helps the business to increase productivity
* Analyze data to verify accuracy of conclusions. Explain the financial concepts used in making business decisions.

**BCA – 442 Business Applications**

1. **Sales Order Processing System** **10Hr**
   Sales Enquiry & preparation of Quotation
   Order acceptance
   Dispatch & Invoicing
   Sales Analysis ( based on products, Customers )
   Sales Invoice

2. **Purchase Order Processing System** **10Hr**
   Enquiry & receive Quotation
   Vendor selection ( Vendor analysis )
   Order preparation ( with delivery schedule )
   Order amendment
   Receipt of material ( goods inward / GRN )

Supplier's bill passing
Follow up of pending purchase order

3. **Inventory Management System** **12Hr**
   Stock accounting & control
   ( raw material, work-in-progress, finished goods )
   Stores transactions ( Receipts, Issues & adjustments )
   Bin card & Stock ledger
   Lead time
   BOM processing with product configuration
   Inventory levels – EOQ – ABC analysis
   Inventory control Reports ( slow moving - non moving items )

4. **Hotel Management System** **8Hr**
   Enquiry & Booking ( Room reservation )
   Room & Services details
   Check-in, Stay & Check-out of customer
   Billing

**Note ( For Teachers )**

1. Each topic should be discussed thoroughly.
2. Need of computerization
3. Development of the system using -----
   System flow, DFD , ERD, Related report format

**Reference Books :**


· MIS by W.S. Jawadekar
· MIS by Jerome Kanter
· MIS by Gordon B. Davis
· MIS by Laudon and Laudon
· Marketing Management by Philip Kotler
· Production and Operations Management by Mayer
· Modern Production Management by R V Badi

| | | |
|---|---|---|
| Semester | Fourth | Teaching Hrs = 40 |
| Subject Code | BCA - 445 | Practice/Assignment Hrs = 20 |
| Subject Name | Oracle | Total Hrs :- 60 |

| Teaching Scheme | | | Examination Scheme | | | Credits |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 4 |

Course Outcomes (COs)
After learning this course student will be able to,

* Enhance the knowledge and understanding of Database analysis and design.
* Enhance the knowledge of the processes of Database Development and Administration using SQL and PL/SQL.
* Preparation of background materials and documentation needed for Technical Support using SQL and PL/SQL.
* Use the Relational model and how it is supported by SQL and PL/SQL
* Solve Database problems using Oracle 9i SQL and PL/SQL. This will include the use of Procedures, Functions, Packages, and Triggers.

## BCA – 445 ORACLE

### 1. Introduction to RDBMS — 1 Hrs

- What is RDBMS
- Difference between DBMS & RDBMS

### 2. SQL (Structured Query Language) — 13 hrs

- Subdivisions of SQL
  DDL, DML ,DCL with all commands
- Data Types
- The CREATE TABLE Command,
  Constraints in CREATE TABLE
- Inserting Data into tables
- Viewing Data in the tables ( SELECT with all options )
- Sorting data in a table (Order By)
- Group By, Having clause
- Delete operations
- Updating the contents of the table
- Modifying structure of a table

- Renaming table, Truncating tables, Destroying table
- Data Constraints (Primary Key, Foreign Key, Unique Key, Check, Default, NOT NULL )
- Computations done on Table data (Arithmetic Operators, logical operators, range searching, pattern matching(LIKE)
- Functions (Aggregate functions, Numeric Functions, Character Function, Date function, Conversion function)
- Sub queries
- Joins (Simple Join, inner join, outer join, cross join)

**3. Oracle Objects** **3 Hrs**

- Views
- Sequences
- Index

**4. PL/SQL** **10 Hrs**

- Introduction to PL/SQL
- Architecture of PL/SQL
- Data types
- PL/SQL blocks (attribute- %TYPE, %ROWTYPE)
- Operators, functions, comparisons, numeric, character, date
- Control Statements
    1. Conditional control (if statement)
    2. Interactive control (Loops)
    3. Sequential Control (GOTO statement)

**5. Error Handling (Exception handling)** **1 Hrs**

Pre-defined,
User defined

**6. Functions, Procedures** **1 Hrs**

**7. Cursors** **5 Hrs**

Definition
Types of cursors (Implicit, explicit)

**8. Triggers** **2 Hrs**

**9. Packages** **1 Hrs**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Semester** | **Fourth** | | | | **Teaching Hrs = 26** | |
| **Subject Code** | **BCA - 443** | | | | **Practice/Assignment Hrs = 4** | |
| **Subject Name** | **Cyber Security Level -II** | | | | **Total Hrs :- 30** | |
| Teaching Scheme | | | Examination Scheme | | | Credits |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 2 |

Course Outcomes (COs)
After learning this course student will be able to,

* Evaluate the computer network and information security needs of an organization.
* Assess cyber security risk management policies in order to adequately protect an organization's critical information and assets.
* Measure the performance of security systems within an enterprise-level information system.
* Distinguish system and application security threats and vulnerabilities
* Describe different classes of attacks
* Analyze threats and risks within context of the cyber security architecture

## BCA – 443 Cyber Security Level-II Total -35 Hr

| | | |
|---|---|---|
| CHAPTER 1 | I.T. ACT 2000 & ITS AMENDMENTS | 4Hr |
| CHAPTER 2 | CASE STUDIES FOR SECURITY ANALYSIS | 5Hr |
| CHAPTER 3 | PC AUDITING & FACING MALWARES | 4Hr |
| CHAPTER 4 | LINUX ESSENTIALS | 5Hr |
| CHAPTER 5 | WEB VULNERABILITIES & ATTACKS | 4Hr |
| CHAPTER 6 | FINANCIAL FRAUDS | 5Hr |
| CHAPTER 7 | TECHNICAL ATTACKS ON WIRELESS & DATABASES | 4Hr |

CHAPTER 8 PENETRATION TESTING 4Hr

| Semester | Fourth | Teaching Hrs = 40 |
|---|---|---|
| Subject Code | BCA - 446 | Practice/Assignment Hrs = 20 |
| Subject Name | Environmental Studies | Total Hrs :- 60 |

| Teaching Scheme | | | Examination Scheme | | | Credits |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 4 |

Course Outcomes (COs)
After learning this course student Will be able to

* Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.
* Appreciate concepts and methods from ecological and physical sciences and their application in environmental problem solving.
* Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
* Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.

**Unit 1: Introduction to environmental studies**

• Multidisciplinary nature of environmental studies;

• Scope and importance; Concept of sustainability and sustainable development. **(2 lectures)**

**Unit 2: Ecosystems**

• What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chains, food webs and ecological succession. Case studies of the following ecosystems :

a) Forest ecosystem

b) Grassland ecosystem

c) Desert ecosystem

d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) **(6 lectures)**

**Unit 3 : Natural Resources : Renewable and Non-- renewable Resources**

• Land resources and landuse change; Land degradation, soil erosion and desertification.

• Deforestation: Causes and impacts due to mining, dam building on Environment, forests, biodiversity and tribal populations.

• Water: Use and over--exploitation of surface and ground water, floods, droughts, conflicts over water (international & inter--state).

• Energy resources : Renewable and non renewable energy sources, use of alternate energy sources, growing energy needs, case studies. **(8 lectures)**

**Unit 4 : Biodiversity and Conservation**

• Levels of biological diversity : genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots

• India as a mega--biodiversity nation; Endangered and endemic species of India

• Threats to biodiversity : Habitat loss, poaching of wildlife, man--wildlife conflicts, biological Invasions; Conservation of biodiversity: In--situ and Ex--situ conservation of biodiversity.

• Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value. **(8 lectures)**

**Unit 5 : Environmental Pollution**

• Environmental pollution : types, causes, effects and controls; Air, water, soil and noise pollution

• Nuclear hazards and human health risks

• Solid waste management: Control measures of urban and industrial waste.

• Pollution case studies. **(8 lectures)**

**Unit 6 : Environmental Policies & Practices**

• Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture

• Environment Laws: Environment Protection Act; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act. International agreements: Montreal and Kyoto protocols and Convention on Biological Diversity (CBD).

• Nature reserves, tribal populations and rights, and human wildlife conflicts in Indian context. **(7 lectures)**

**Unit 7 : Human Communities and the Environment**

• Human population growth: Impacts on environment, human health and welfare.

• Resettlement and rehabilitation of project affected persons; case studies.

• Disaster management : floods, earthquake, cyclones and landslides.

• Environmental movements : Chipko, Silent valley, Bishnois of Rajasthan.

• Environmental ethics: Role of Indian and other religions and cultures in environmental conservation.

• Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi). **(6 lectures)**

**Unit 8 : Field work**

• Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.

• Visit to a local polluted site--Urban/Rural/Industrial/Agricultural.

• Study of common plants, insects, birds and basic principles of identification.

• Study of simple ecosystems--pond, river, Delhi Ridge, etc. **(5 lectures)**

**Reference Books:**

1. Carson, R. 2002. *Silent Spring*. Houghton Mifflin Harcourt.

2. Gadgil, M., & Guha, R.1993. *This Fissured Land: An Ecological History of India*. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999.*Global Ethics and Environment*, London, Routledge.
4. Gleick, P. H. 1993. *Water in Crisis*. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Groom, Martha J., Gary K. Meffe, and Carl Ronald Carroll.*Principles of Conservation Biology*. Sunderland: Sinauer Associates, 2006.
6. Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. *Science,* 339: 36--37.
7. McCully, P. 1996. *Rivers no more: the environmental effects of dams*(pp. 29--64). Zed Books.
8. McNeill, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
9. Odum, E.P., Odum, H.T. & Andrews, J. 1971.*Fundamentals of Ecology*. Philadelphia: Saunders.
10. Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
11. Rao, M.N. & Datta, A.K. 1987. *Waste Water Treatment*. Oxford and IBH Publishing Co. Pvt. Ltd.
12. Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012.*Environment*. 8th edition. John Wiley & Sons.
13. Rosencranz, A., Divan, S., & Noble, M. L. 2001. *Environmental law and policy in India. Tripathi 1992*.
14. Sengupta, R. 2003. *Ecology and economics*: An approach to sustainable development. OUP.
15. Singh, J.S., Singh, S.P. and Gupta, S.R. 2014. *Ecology, Environmental Science and Conservation*. S. Chand Publishing, New Delhi.
16. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. *Conservation Biology*: *Voices from the Tropics*. John Wiley & Sons.
17. Thapar, V. 1998. *Land of the Tiger*: *A Natural History of the Indian Subcontinent*.
18. Warren, C. E. 1971. *Biology and Water Pollution Control*. WB Saunders.
19. Wilson, E. O. 2006.*The Creation: An appeal to save life on earth*. New York: Norton.
20. World Commission on Environment and Development. 1987.*Our Common Future*. Oxford University Press.

# TILAK MAHARASHTRA VIDYAPEETH

## BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEM:V

| | | |
|---|---|---|
| Semester | Fifth | Teaching Hrs = 40 |
| Subject Code | BCA – 541 | Practice/Assignment Hrs = 20 |
| Subject Name | ASP.Net | Total Hrs :- 60 |

| Teaching Scheme | | | Examination Scheme | | | |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | Credits |
| 4 | 2 | 6 | 60 | 40 | 100 | 4 |

Course Outcomes (COs)
After learning this course student will be able to,

* Separate page code from content by using code-behind pages, page controls, and components.
* Display dynamic data from a data source by using Microsoft ASP.Net and data binding.
* It is open source language & platform independent.
* Create a web form with server controls.

**1. Introduction to ASP.NET** **7 L**

The .NET Framework, The .NET programming Framework, .NET languages, The .NET class library, ASP vs. ASP.NET, About ASP.NET, Basic difference between C# and VB.NET

**2. ASP.NET 2.0** **7 L**

Features of ASP.NET 2.0, Stages in Web Forms Processing, Introduction to Server Controls, HTML Controls, Validation Controls, User control, Data Binding Controls, Configuration, Personalization, Session State

**3. Declaring Variables in ASP.NET** **7 L**

Data Types, Initializes, Arrays, Enumerations. Variable Operations- Advanced Math Operations, Type Conversions. Object Based Manipulation - String Object, Date Time Object, Time span object & Array Object. Conditional Structures, Loop Structures, Functions & Subroutines – Parameters, Procedure Overloading, Delegates.

**4. Web Server and User** **7 L**

Installing IIS. IIS Manager- Creating a virtual directory, Virtual directories and Applications, Folder Settings, Adding virtual directory to your neighborhood.

**5. ASP. NET Applications** **7 L**

ASP.NET file types, the bin directory, code-behind, The Global.asax, Understanding ASP.NET classes. ASP.NET configuration

**6. Overview of ADO.NET** **7 L**

ADO.NET architecture, Accessing Data using data adapters and datasets, using command and data reader, binding data to data bind controls, displaying data in data grid.

**Reference Books:**


1) The complete Reference ASP.NET by Matthew MacDonald- Tata McGraw-Hill.
2) Professional ASP.NET – Wrox Publication

| | | | | | | |
|---|---|---|---|---|---|---|
| Semester | Fifth | | | | Teaching Hrs = 40 | |
| Subject Code | BCA - 542 | | | | Practice/Assignment Hrs = 20 | |
| Subject Name | Linux | | | | Total Hrs :- 60 | |
| Teaching Scheme | | | Examination Scheme | | | Credits |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 4 |

Course Outcomes (COs)

After learning this course student will be able to,

* Learn Open source Operating system concepts.
* Effectively use the UNIX/Linux system to accomplish typical personal, office, technical, and software development tasks.
* Identify and use UNIX/Linux utilities to create and manage simple file processing operations, organize directory structures with appropriate security, and develop shell scripts to perform more complex tasks.
* Effectively use software development tools including libraries, preprocessors, compilers, linkers, and make files.

**BCA -542- LINUX**

**Unit-I**

Linux Operating system history, concept and architecture, Basic features of Linux, Advantages of Linux, Basic architecture of Unix/Linux operating system, Overview of Linux kernel, Kernel space, user space. Shells in Linux, features of shells, Minimum Hardware requirement for installation of linux operating system, Installation methods.

**Unit-II**

Linux file system architecture, commands for files and directories:touch,cd,mkdir,rmdir,rm,pwd,more,less,head,tail,Creating and viewing files using cat and VI editor. Detail study of VIM editor. Standard input and output operators in linux.

**Unit-III**

Linux system administration :user administration, adding and deleting of users, File ,and directory permissions in Linux, special file and directory permissions like stiky bit,SUID and SGID,creating and managing groups, modifying group attributes, study of su command ,configuring X windows in linux,KDE and GNOME environments.

**Unit-IV**

Study of processes: processes and processes states, nit process,Xinetd processes, Process priority ,nice,renice commands, scheduling of tasks using crontab,ps,kill,find,sort commands ,study of rpm command. Tar command, disk related commands, disk partitioning and formatting, study of /etc/fstab.

**Unit-V**

Accessing file system & related devices, Basics of troubleshooting, Run levels and init ,study of /etc/inittab,Recovery of root password, shell programming-scripting basics, conditional statements.

| | | |
|---|---|---|
| Semester | Fifth | Teaching Hrs = 40 |
| Subject Code | BCA - 543 | Practice/Assignment Hrs = 20 |
| Subject Name | SQT | Total Hrs :- 60 |

| Teaching Scheme | | | Examination Scheme | | | Credits |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 4 |

Course Outcomes (COs)

After learning this course student will be able to,

* Understanding credible research resources verified through methodological software engineering research processes.
* Do Software Testing Techniques, Measures, and Process
* Experience in conducting a software engineering research project based on peer-reviewed research literature, and, following sound research methodologies.
* Analyze different approaches to software testing and quality assurance, and select optimal solutions for different situations and projects.

# BCA 543 SQT

**1 Quality Concept**

1.1Definition of Quality, QA, SQA
1.2 Quality factors
1.3 Software Quality Metrics
1.4 Process Improvement
1.5 Process and Product Quality
1.6 The SEI Process Capability Maturity model, ISO, Six-Sigma

1.7 Process Classification

**2 Software Quality Assurance & Software Reliability**

2.1 Need for SQA
2.2 SQA Activities
2.3 Building blocks of SQA
2.4 SQA Planning & Standards
2.5 Reliability Measures
2.6 Reliability models

**3 Verification & Validation**

3.1 Verification & Validation Planning
3.2 Software inspections
3.3 Automated static Analysis

**4 Software Testing Fundamentals**

4.1 Testing objectives
4.2 How test information flows
4.3 Testing lifecycle
4.5 Test Cases – What it is?, Test Case Designing (Concept & introduction should be covered here. Detailed techniques should be covered in Unit No. 2.4)

**5 Levels of Testing**

5.1 Unit Testing
5.2 Integration Testing
5.3 System Testing
5.4 Acceptance Testing
5.5 Alpha testing & Beta testing
5.6 Static vs. Dynamic testing
5.7 Manual vs. Automatic testing
5.8 Testers workbench
5.9 11-steps of testing process (Only steps should be covered)

**6 Different types of Testing**

6.1 Installation Testing
6.2 Usability testing
6.3 Regression testing
6.4 Performance Testing
6.5 Load Testing
6.6 stress testing
6.7 Security testing

**7 Static & Dynamic Testing**

7.1 Static Testing Technique
7.2 Review types: Informal Review, Technical or peer review, Walkthrough, Inspection,static analysis
7.3 Review Meeting,
7.4 Review Reporting & Record keeping, Review guidelines & Review checklist
7.5 Data flow analysis
7.6 Control flow analysis
7.7 Cyclometric Analysis
7.8 Dynamic testing – need & Advantages

**8 Black Box & White Box Testing (Test CaseDesign Techniques)**

8.1 Functional Testing (Black Box) Equivalence partitioning, BVA, Cause- Effect graphing, Syntax testing (Concept & Test case generation only)
8.2 Structural Testing (White Box) Coverage testing, Statement coverage, Branch & decision coverage, Path coverage
8.3 Domain Testing
8.4 Non functional testing techniques
8.5 Validation testing Activities Low level testing, High level testing
8.6 Black box vs. White Box

**9 Testing specialized Systems and Applications**

1. Testing object oriented software
2. Testing Web based Applications

**Reference:**


1. Software Engineering - R. Pressmen – 6th Ed
2. Software Engineering - Sommerville
3. Introducing Software Testing - Louise Tamres
4. Effective Methods for software Testing - William Perry
5. Software Testing in Real World - Edward Kit
6. Software Testing Techniques - Boris Beizer
7. Software quality assurance: Principles and Practices - Nina Godbole, Narosa


| Semester | Fifth | | | | Teaching Hrs = 26 | |
|---|---|---|---|---|---|---|
| Subject Code | BCA - 544 | | | | Practice/Assignment Hrs = 4 | |
| Subject Name | PPM II | | | | Total Hrs :- 30 | |
| Teaching Scheme | | | Examination Scheme | | | Credits |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 2 |

Course Outcomes (COs)
After learning this course student will be able to,

* Evaluate the global context for taking managerial actions of planning, organizing and controlling..
* Integrate management principles into management practices.
* Assess managerial practices and choices relative to ethical principles and standards.
* Specify how the managerial tasks of planning, organizing, and controlling can be executed in a variety of circumstances.
* Evaluate approaches to addressing issues of diversity.
* Determine the most effective action to take in specific situations.

# BCA 544 Principles and Practice of Management (PPM-II)

**1. Staffing:**

a. Meaning, definitions
b. Importance
c. Recruitment and selection

d. Training and development
e. Performance appraisal

**2. Directing:**
a. Meaning, definitions
b. Principles of directing

**3. Communication:**
a. Meaning and definitions
b. Elements
c. Process
d. Importance
e. Types
f. Principles

**4. Motivation:**
a. Meaning and definitions
b. Objectives
c. Theories of motivation
a. Maslow's theory of hierarchy of needs
b. Herzberg's two factor theory
c. McClelland's theory
d. Expectancy theory
e. Equity theory
f. Reinforcement theory
d. Special motivational techniques

**5. Leadership:**
a. Meaning and definitions
b. Features
c. Importance
d. Theories
a. Great man
b. Trait
c. Situational
d. Behavioral
e. Followers
f. Managerial grid
g. Path goal
e. Styles of leadership
a. Autocratic
b. Participative
c. Laissez faire
f. Qualities of a leader

**6. Controlling:**
a. Meaning and definitions
b. Features

c. Control process
d. Control techniques
a. Traditional
b. Modern

**7. Recent trends in management:**
a. Social responsibility of mgmt
b. Stress mgmt
c. Total quality mgmt.
d. Disaster mgmt.
e. Event mgmt.
f. M.B.O. (management by objectives) BCA-526 Practical VB.Net

| | | |
|---|---|---|
| Semester | Fifth | Teaching Hrs = 26 |
| Subject Code | BCA - 545 | Practice/Assignment Hrs = 4 |
| Subject Name | Cyber Security-III | Total Hrs :- 30 |

| Teaching Scheme | | | Examination Scheme | | | Credits |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 2 |

Course Outcomes (COs)
After learning this course student will be able to,

* Evaluate the computer network and information security needs of an organization.
* Assess cyber security risk management policies in order to adequately protect an organization's critical information and assets.
* Measure the performance of security systems within an enterprise-level information system.

# BCA 545 Cyber Security-III

**1. CYBER FORENSICS & CYBER CRIME INVESTIGATION (40%)**
Cyber Crime as We Enter the Twenty-First Century, WHAT IS CYBER CRIME?, Specific computer crimes, HOW DOES TODAY'S CYBER CRIME DIFFER FROM THE HACKER

EXPLOITS OF YESTERDAY?, REASONS FOR CYBER CRIME, INDUSTRIAL ESPIONAGE — HACKERS FOR HIRE, PUBLIC LAW ENFORCEMENT'S ROLE IN CYBER CRIME INVESTIGATIONS, THE ROLE OF PRIVATE CYBER CRIME INVESTIGATORS AND SECURITY CONSULTANTS IN INVESTIGATIONS, The Initial Contact, Client Site Arrival, Evidence Collection Procedures

**2. CYBER LAW (30%)**

"Cyber Law – An Indian Perspective", What Is Cyber Crime?, Emergence of Information Technology Act, 2000, Types of Attacks By Hackers, Types of Techniques used by the Crackers/ Cyber Terrorists, Measures To Curb Cyber Crime, Investigations And Search Procedures, Problems Underlying Tracking of Offence, How Efficient Is Information Technology Act 2000?, Data Protection, Process of Reporting Internet Frauds, WHAT IS A COMPUTER FORENSICS REPORT?, What Is an Expert Report?, A TEMPLATE FOR COMPUTER FORENSIC REPORTS, Attacker Methodology, User Applications, Internet Activity or Web Browsing History.

**3. DIGITAL EVIDENCE & FRAUDS**

WHAT IS DIGITAL EVIDENCE?, Digital Forensic Examiner Proficiency and Competency Tests, Imaging Electronic Media (Evidence), Collecting Volatile Data, Analysis, Reporting, Firewall Forensics, The Value (or Not) of IP Addresses, Deciphering Port Numbers, Securing the Firewall, Network Forensics, Build a Monitoring Workstation, Analyzing the Data, Firewall Log Analysis and Management, Network Forensics Tools, Database Forensics, Testing For SQL Injection Vulnerabilities, Mobile Forensics, DIGITAL FRAUDS, Computer Crimes, Steps for Computer Crime Investigation.

**4. Mobile Frauds & Countermeasures**

Mobile Forensics, Identification of Mobile, Cell Tracking, Types of LBS Technology, Case Study, Recovering Stolen Mobile, Here are steps on how to find a stolen or lost phone, Recover your stolen mobile using IMEI number, Identifying Fake SMS, Collecting Evidence to be presented in Court, How to take a Complaint from the Victim?, Do and don't for mobile user.

**5. Forensic Data Acquisition/ Data Recovery**

The Forensics Process, Collecting Digital Evidence, Live vs. Dead analysis, Imaging electronic media (evidence), Collecting Volatile Data, Analysis, Comparison to Physical Forensics, Computer Forensics Certifications, TIMELY EVIDENCE COLLECTION AND CHAIN OF CUSTODY, "MARKING" EVIDENCE WITH AN MD5 HASH AND ENCRYPTION — CRCMD5 AND PGP, FILELIST, CRCMD5, SEALING EVIDENCE, USING SAFEBACK 2.0 TO TAKE AN IMAGE OF A FIXED DISK, TAKING A HARD DISK INVENTORY WITH FILELIST, Data Recovery, Recovering data after physical damage, Recovery techniques, Hardware Repair, Disk Imaging, Recovering data after logical damage, Preventing logical damage, Recovery Techniques, Consistency checking, Data carving.

**6. Operating System Forensics**

WHERE EVIDENCE RESIDES ON WINDOWS SYSTEMS?, CONDUCTING A WINDOWS INVESTIGATION, Reviewing All Pertinent Logs, Event Viewer, Event Log Drawbacks, Where to Look for Evidence, IIS Logs, Reviewing Relevant Files, Incident Time and Time/Date Stamps, Where to Look for Evidence, Proprietary Email Files, Netscape Messenger Mail,

Microsoft Outlook Mail, Deleted Files and Data, Temporary Files , Backup File Recovery, The Swap File, Broken Links, Web Browser Files, Looking for Unusual or Hidden Files, Remote Control and Remote Access Services, Administrative Shares, Reviewing Searches and Files Used, AccessData Registry Viewer, Registry Viewer Overview, Windows Registry Basics, Opening and Closing Registry Files, Forensic Analysis of a Live Linux System, Pt. 1 Mariusz

| **Semester** | Sixth | Teaching Hrs = 35 |
|---|---|---|

Burdach 2004-03-22, Forensic Analysis.

# TILAK MAHARASHTRA VIDYAPEETH

## BACHELOR OF COMPUTER APPLICATIONS (B.C.A.) SEM:VI

| Subject Code | BCA - 641 | | | | Practice/Assignment Hrs = 10 | |
|---|---|---|---|---|---|---|
| **Subject Name** | **UML** | | | | Total Hrs :- 45 | |
| **Teaching Scheme** | | | **Examination Scheme** | | | **Credits** |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **3** |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

- Master the fundamental principles of OO programming.
- Master key principles in OO analysis, design, and development.
- Be familiar with the application of the Unified Modelling Language (UML) towards analysis and design
- Master common patterns in OO design and implement them.
- Be familiar with alternative development processes.
- Be familiar with group projects and presentations.
- Be exposed to technical writing and oral presentations

1.1. Getting started
1.2. Models
    1.2.1. Importance of modeling
    1.2.2. Principles of modeling
    1.2.3. Object-oriented modeling
1.3. Review of Object-Orientation
    1.3.1. Objects and classes
    1.3.2. Abstraction
    1.3.3. Inheritance
    1.3.4. Polymorphism
    1.3.5. Encapsulation
    1.3.6. Message passing
    1.3.7. Associations
    1.3.8. Aggregation

**2.** Introduction to UML
2.1. History
2.2. The components of the UML
2.3. Building blocks of the UML: Things, Relationships, Diagrams
2.4. Common mechanisms in the UML
2.5. Architecture

**3.** Basic structural modeling
3.1. Classes
3.2. Relationships

| Semester | Sixth | Teaching Hrs = 40 |
|---|---|---|

3.3. Class diagrams

**4.** Advanced structural modeling

4.1. Interfaces, Types and Roles

4.2. Packages

4.3. Instances

4.4. Object diagrams

5. Basic behavioral modeling

5.1. Interactions

5.2. Use cases and use case diagrams

5.3. Interaction diagrams

5.4. Activity diagrams

**6.** Advanced behavioral modeling

6.1. Events and Signals

6.2. State machines

6.3. Processes and Threads

6.4. Time and Space

6.5. Statechart diagrams

**7.** Architectural modeling

7.1. Components and Component diagram

7.2. Deployment diagram

7.3. Collaborations

**8.** New diagrams in UML 2.0

**Referance Books:**


- Unified Modeling Language User Guide- Grady Booch, Games Rumbaugh, Ivar Jacobson
- UML 2 for dummies – Michael Jaeasse, Chonoles, James A., Schardt
- Learning UML 2.0 – Russmiles, Kim Hamilton

| Subject Code | BCA - 642 | | | | Practice/Assignment Hrs = 20 | |
|---|---|---|---|---|---|---|
| Subject Name | CTIT(Current Trends in IT) | | | | Total Hrs :- 60 | |
| Teaching Scheme | | | Examination Scheme | | | Credits |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| 4 | 2 | 6 | 60 | 40 | 100 | 4 |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

- Analyze Open source mobile technology, Explain Basics of Application development
- Explain Framework, SDK, Emulation
- Explain Android Application structure
- Explain Android Activities lifecycle and UI Layout
- Explain Expressions, Manifest, other necessary UI concept
- List and explain GUI Objects,
- Explain Layout Design concepts
- Explain Android Event driven Programming, Activity Lifecycle, Explain Exception handling

**BCA-642 CTIT (Current Trends in IT) (Mobile Computing)**

**Topic 1) HTMH5 (10 Hours)**

Introduction, features, elements & attributes in HTML5, <canvas>, <video>, <audio>. Introduction to Scalable Vector Graphics (SVG), Geolocation,
Form input types, HTML5 web storage.
Introduction of HTML5 Web worker.
CSS**:** Introduction to Style Sheet, types of style Sheets: Inline, External, Embedded CSS, Text formatting properties, CSS Border, margin properties, Positioning.Use of classes in CSS, color properties, use of &

**Topic 2) Introduction to Android (3 Hours)**

Introduction to Android: A little Background about mobile technologies, Android - An Open Platform for Mobile development, Android SDK Features, Android versions and features.

**Topic 3) Tools for Development (3 Hours)**

Installing Android, First Android application, Running on Emulator, Android development Tools, Eclipse, IDEs and Tools

**Topic 4) Android Architecture and OOPS (4 Hours)**

Building Blocks of Android, Java Classes and Objects, Class Methods and Instances, Inheritance and Polymorphism in Java, Interface and Abstract class.

**Topic 5) Android UI & Advance JAVA (6 Hours)**

Fundamental Android UI Design, Introducing Views, In Creating new Views,
Introducing Layouts, Creating new Views, Using resources, Complex UI components, Building UI for performance, Using themes, Debugging Android Code.

**Topic 6) Android Graphics and Multimedia (8 Hours)**

Basic Graphics, Input Handling, Playing Audio & Video, Recording Audio and Video, Adding new media to media store, Raw Audio Manipulation.

**Topic 7) Database and Content Providers (8 Hours)**

Introducing Android Databases, Introducing SQLite on Android, SQLiteOpenHelper and creating a database, Opening and closing a database, Working with cursors Inserts, updates, and deletes, Creating new content Provider, Using Content providers, Native Android Content provider.

**References:**


1. Hello, Android by Ed Burnette
2. Professional Android 2 Application Development Paperback, Author, Reto Meier, Wrox Publications
3. Professional Android Application Development by Reto Meier, Wiley India Pub.

http://developer.android.com

| | | | | | | |
|---|---|---|---|---|---|---|
| **Semester** | Sixth | | | | Teaching Hrs = 26 | |
| **Subject Code** | BCA – 643 | | | | Practice/Assignment Hrs = 4 | |
| **Subject Name** | **ERP** | | | | Total Hrs :- 30 | |
| **Teaching Scheme** | | | **Examination Scheme** | | | **Credits** |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **2** |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

- To comprehend the technical aspects of ERP systems
- To understand concepts of reengineering and how they relate to ERP system implementations
- To be able to map business processes using process mapping techniques
- To understand the steps and activities in the ERP life cycle
- To be able to identify and describe typical functionality in an ERP system
- To obtain practical hands-on experience with ERP Software

## BCA 643-ERP

**1.ERP :**

An Overview, Enterprise – an overview, Benefits of ERP, ERP and Related Technologies, Business Process Reengineering (BPR), Data Warehousing, Data Mining, On- line Analytical Processing (OLAP), Supply Chain Management.

**2.ERP IMPLEMENTATION:**

ERP Implementation lifecycle, Implementation Methodology, ERP implementation – The hidden cost, Organizing the Implementation, Vendors, Consultants and Users, Contracts with Vendors, Consultants and Employees, Project Management and Monitoring, After ERP implementation.

**3.THE BUSINESS MODULES:**

Business Modules in an ERP packages, Finance, Manufacturing, Human Resource, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution.

**4.ERP – PRESENT AND FUTURE**

Turbo Charge the ERP System, Enterprise Integration, Application (EIA), ERP and E- Commerce, ERP and Internet, Future Directions in ERP.

| Semester | Sixth | Teaching Hrs = 26 |
|---|---|---|
| Subject Code | BCA - 644 | Practice/Assignment Hrs = 4 |
| Subject Name | Organizational Behavior | Total Hrs :- 30 |

| Teaching Scheme | | | Examination Scheme | | | Credits |
|---|---|---|---|---|---|---|
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **2** |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

- Upon successful completion of this course, the student will have demonstrated the ability:
- To discuss the development of the field of organizational behaviour and explain the micro and macro approaches in the business
- To identify the process used in developing communication and resolving the conflicts
- To explain group dynamics and demonstrate skills required for working in team building
- To identify the various leadership styles and the role of leaders in a decision making process.
- To discuss the implementation of organizational change.

# BCA 644-Organizational Behavior

**1. Organization & Organizational Behavior**

Introduction
Organization
Organizational Behaviour
Intuition & Systematic Study
Organization & Organizational Behavior
Historical Evolution of Organizational Behavior
Discipline Organizational Behavior
Organizational Behavior to –Day
Models for organizational Behaviour

**2. Perception & Individual Decision Making**

Introduction
Factors Influencing Perception
Attribution Theory
Frequently used Shortcuts in Judging others
Specific Application in Organizations
The Link between Perception & Individual Decision Making
Improving Creativity in Decision Making
How are Decisions actually made in Organizations?
Individual Differences: Decision Making Styles
Organizational Constraints

Ethics in Decision Making

**3. Personality & Attitude**

Introduction
Definition
Theories on Personality
The shaping of Personality
Assessment of Freud's Stages
Immaturity to Maturity
Determinants of Personality
Personality Traits
The Myers – Briggs Framework
Major Traits Influencing Organizational Behavior
Personality & Organizational Behavior
Attitudes
Formation of Attitudes
Types of Attitudes
Functions of Attitudes
Changing Attitudes
Ways of Changing
Types of Change
Attitudes & OB
Job Satisfaction
Job Involvement
Organizational Commitment
Values
Job satisfaction

**4. Learning**

Nature of Learning
Process of Learning
Cognitive Theory of Learning
Social Learning Theory
Principles of Learning
Schedules of Learning
Learning Curves
Learning & Organizational Behavior

5. **Motivation**

Introduction
Intrinsic and extrinsic motivation
Some theories on motivation
Motivation and Performance
Motivation strategies
Importance of motivation
Motivational drives

6. **Stress**

Introduction
Model of stress
Stress manifestation
Coping strategies
Coping and personality
Sources of stress
Stress management
Organization approaches to stress management

| | | | | | | |
|---|---|---|---|---|---|---|
| **Semester** | Sixth | | | | Teaching Hrs = 35 | |
| **Subject Code** | BCA – 646 | | | | Practice/Assignment Hrs = 10 | |
| **Subject Name** | Cloud technology | | | | Total Hrs :- 45 | |
| **Teaching Scheme** | | | **Examination Scheme** | | | **Credits** |
| Teaching Hrs/Week | Practice/Assignment Hrs/Week | Total Hrs | External Exam | Internal Exam | Total Marks | |
| **4** | **2** | **6** | **60** | **40** | **100** | **4** |

**Course Outcomes (COs)**

**After learning this course student will be able to,**

- Define various basic concepts related to cloud computing technologies.
- Identify the architecture and concept of different cloud models: IaaS, PaaS, SaaS, and services such as public cloud, private cloud, hybrid cloud, etc.
- Have knowledge on reading and writing in cloud storage.
- Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure and Amazon Web Services and other businesses cloud applications

**Topic 1) Introduction to Linux Networking (8 Hours)**

Basics of linux OS, advance user management, permissions & Task Scheduling, RAID Implementation (RAID0, RAID1, RAID5, RAID6, RAID10), Logical Volume Management (LVM), software Management using rpm, yum.

Linux Networking: DHCP Server (Dynamic Host Configuration Protocol), Apache Web Server, FTP Server, NFS Server, CIFS Server, DNS Server, access control lists

**Topic 2) Introduction to Virtualization (4 Hours)**

What is virtualization, concepts, Implementation of Virtualization.Implementation of remote accessibility, advantages & disadvantages, limitation.Relationship between Virtualization & Cloud Computing.

**Topic 3) Virtualization for Enterprise (6 Hours)**

Virtualization for Enterprise: Vmware, Hyper-V, Virtual Box.

Bare Metal Virtualization, NAS (Network attached storage) implementation, SAN (Storage Area Network) implementation

**Topic 4) Cloud Computing Fundamental (6 Hours)**

Cloud Computing definition, private, public and hybrid cloud. Cloud types; IaaS, PaaS, SaaS. Benefits and challenges of cloud computing, public vs private clouds, role of virtualization in enabling the cloud;

Business Agility: Benefits and challenges to Cloud architecture. Application availability, performance, security and disaster recovery; next generation Cloud Applications.

**Topic 5) Cloud Applications& Services (6 Hours)**

Technologies and the processes required when deploying web services; Deploying a web service from inside and outside a cloud architecture, advantages and disadvantages.

Cloud Services: Reliability, availability and security of services deployed from the cloud. Performance and scalability of services, tools and technologies used to manage cloud services deployment; Cloud Economics: Cloud Computing infrastructures available for implementing cloud based services.

**Topic 6) Selecting Cloud Platform (4 Hours)**

Economics of choosing a Cloud platform for an organization, based on application requirements, economic constraints and business needs (e.g Amazon, Microsoft and Google)

Reference Books:


1. Distributed and Cloud Computing, 1st edition, Morgan Kaufmann, 2011.
2. GautamShroff, Enterprise Cloud Computing Technology Architecture Applications [ISBN: 978-0521137355]
3. Toby Velte, Anthony Velte, Robert Elsenpeter, Cloud Computing, A Practical Approach [ISBN: 0071626948]
4. Dimitris N. Chorafas, Cloud Computing Strategies [ISBN: 1439834539]