BACHELOR OF COMPUTER APPLICATIONS (B.C.A)
(Choice Based Credit System)

Regulations & Syllabus

2017-18 onwards
Pondicherry University  
Bachelor of Computer Applications (B.C.A)  
REGULATIONS  
(Effective from the academic year 2017-2018)

1. **Aim of the Course**

The BCA course aims to impart the students with fundamental and hands on knowledge of computers, applications of computer science and modern computer science applications.

2. **Eligibility of Admission**

Candidates for admission to BCA shall be required to have passed 10 + 2 system of Examination or equivalent with Mathematics / Business Mathematics / Computer Science/ Computer Applications as one of the subjects of study.

3. **Lateral Entry Admission**

Candidates who have passed Diploma in Computer Science / Information Technology/ Computer Technology / Computer Application in I Class (10+3 years of study) are eligible to apply for the lateral entry to the 2\textsuperscript{nd} year of the course subject to availability of seats, but limited to 10\% of the sanctioned intake.

4. **Duration of the course**

The course shall be of three years’ duration spread over six consecutive semesters. The maximum duration to acquire prescribed number of credits in order to complete the Programme of Study shall be twelve consecutive semesters (six years).

5. **Medium**

The medium of instruction shall be English.
6. Course Structure

<table>
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<tr>
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<td>Generic Elective Course</td>
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<td>Discipline Specific Core Course</td>
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**MIL, ENG, AECC**

The crediting of MIL, ENG and AECC courses is as per Pondicherry University UG CBCS regulations.

**DSC and DSE**

At least 60% (72 credits) of the total minimum credit requirement must be earned by the student from DSC and DSE courses as follows in order to obtain the degree - 60 credits from Discipline Specific Core and 12 credits from Discipline Specific Elective courses.
**SEC**

Out of the 4 Skill Enhancement Courses, one course viz. - Online Course / In-Plant Training (2 weeks) / One month Internship / mini project is mandatory. The Online Course to be studied, the organization to be chosen for In-Plant Training or One month internship is to be validated or approved by a panel of members comprising of the Department Faculty, before a student pursues the same.

For the remaining 3 SEC courses, any of the 2 credit Skill Enhancement Courses specified in the curriculum (BCA) could be credited or substituted with Skill Enhancement Courses in the curriculum of other UG computer science courses or Skill Enhancement Courses of other UG Non-Computer Science Disciplines of study that constitute to skill development or an assortment of these without any overlap of courses.

**GE**

Any 2 of the 3 credit Generic Elective Courses specified in the curriculum (BCA) could be credited to constitute the 6 credits or substituted with Generic Elective courses in the curriculum of other UG Computer Science Disciplines of study or UG Courses of Non-Computer Science Disciplines of study that add proficiency to the students - with the advice of the Faculty Advisor, or an assortment of these without any overlap of courses.

**DSE**

The six 4 credit papers to be credited under DSE can be credited from Discipline Specific Elective specialization stream courses as follows:

I. Three of the 4 credit courses should be credited from one specialization stream courses or across the different specialization stream courses specified in the curriculum.

II. The remaining three of the 4 credit courses may be credited from
   a. Another specialization stream courses of the curriculum or across the different specialization stream courses specified in the curriculum without any overlap of courses credited in I above.

   or
b. Another specialization stream courses or across the different specialization stream courses in the curriculum of other UG Computer Science Disciplines of study without any overlap of courses credited in I above.

or

c. An assortment of the above options in II a and IIb.

**OE**

Any 2 of the 3 credit Open Elective Courses specified in the curriculum (BCA) could be credited to constitute the 6 credits or substituted with Open elective courses in the curriculum of other UG Computer Science disciplines of study or substituted with UG Courses of Non-Computer Science Disciplines of study that add proficiency to the students - with the advice of the Faculty Advisor or an assortment of these without any overlap of courses.

**7. Faculty to Students Ratio**

The Faculty to Student Ratio in all the practical / laboratory classes shall be maintained at 1:25.

**8. Pattern of Examination**

I. The End-Semester examination and internal assessments for MIL, ENG, AECC, DSC, GE and OE courses are as per Pondicherry University UG CBCS regulations.

II. All SEC courses (except Online Course / In-Plant Training (2 weeks) / One month Internship) to be treated as a practical / laboratory course and the End-Semester examination to be conducted as per Pondicherry University UG CBCS regulations.

III. The internal assessments for all practical / laboratory courses (for DSC, SEC courses) shall be as follows – 15 marks from two internal practical / laboratory assessment tests and 5 marks based on practical / laboratory course based mini application development.

IV. The internal assessment for DSE courses shall be conducted as follows - 12 marks from two internal assessment tests and 8 marks based only on two internal practical / laboratory assessment tests.
V. The marks for attendance (5 marks) applies to all courses and the awarding of attendance marks is as per Pondicherry University UG CBCS regulations.

VI. The Project work is to be evaluated as follows:

i. The internal assessment (25 marks) is awarded as follows:
   a. 10 marks is awarded based on two internal project reviews conducted in periodic intervals by a panel comprising of members of the Department during the tenure of the project.
   b. The student’s project guide awards 10 marks for the project work and 5 marks for attendance (attendance marks as specified in the Pondicherry University UG CBCS regulations).

ii. The End Semester Examination assessment (75 marks) is evaluated under two aspects viz – i) Project Work – (50 marks) ii) Project Report and Viva-Voce (25 marks)

Passing Minimum

Passing Eligibility and classification for the award of the Degree is as per Pondicherry University UG CBCS regulations.

Lateral Entry

The Lateral Entry students have to complete 102 credits from the DSC, DSE, GE, SE, OE courses as per curriculum (IIIrd to VIth semesters). In addition, they should complete the two AECC courses (4 credits) for the award of the degree. One MIL (3 credits) and one ENG (3 credit) courses also need to be completed, if it is not studied in the last three years of the course eligible for lateral entry admission.

Other aspects of CBCS not covered in this document by default conforms to the Pondicherry University UG CBCS regulations.
PONDICHERRY UNIVERSITY  
Bachelor of Computer Applications (BCA)  
PROPOSED STRUCTURE OF THE COURSE UNDER CBCS 2017-2018

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MIL - Modern Indian Languages (Tamil, Hindi, Sanskrit, etc)
ENG – English
AECC – Ability enhancement Courses (Public Administration and Environmental Studies)
SEC – Skill Enhancement Courses
GE – Generic Elective
DSC – Discipline Specific Core
DSE - Discipline Specific Elective
OE – Open Elective
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**SECOND SEMESTER**

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**THIRD SEMESTER**

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*University Practical Exam/ Viva Should be conducted

**Discipline Specific Core – List of University Practical Courses**

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**Skill Enhancement Courses - List of University Practical Courses**

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### Discipline Specific Core – Theory

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### Discipline Specific Elective

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<td>Foundations of Data Analytics</td>
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**Compulsory**
Bachelor of Computer Applications

under *CHOICE-BASED CREDIT SYSTEM (CBCS)*

(Effective from the academic year 2017-2018)
DISCIPLE SPECIFIC CORE - 1

Paper Code: CSCA113
INTRODUCTION TO PROBLEM SOLVING USING C

Prerequisite: - Basic knowledge of Mathematics and Computers

Objectives:
- To learn the concepts of “C” Programming
- To learn how to use develop software programs for day-to-day applications.

MODULE – I

MODULE - II

MODULE – III
C Functions - Program Modules in C - Math Library Functions – Functions- Function Definitions -Function Prototypes: A Deeper Look - Function Call Stack and Stack Frames- Passing Arguments By Value and By Reference - Recursion vs. Iteration - C Arrays - Defining Arrays - Passing Arrays to Functions- Sorting Arrays- Searching Arrays - Multidimensional Arrays

MODULE – IV
Structure & Union - C Pointers- Pointer Variable Definitions and Initialization- Pointer Operators- Passing Arguments to Functions by Reference - sizeof Operator - Pointer Expressions and Pointer Arithmetic- Relationship between Pointers and Arrays - Pointers to Functions - C Characters and Strings – Character - Handling Library- String- Conversion Functions - Standard Input/Output Library Functions- String-Manipulation Functions -C Formatted Input/Output

MODULE – V
C File Processing - Files and Streams- Creating a Sequential-Access File- Reading Data from a Sequential-Access File - Random-Access Files - Creating a Random-Access File- Writing Data Randomly to a Random-Access File- Reading Data from a Random-Access File- C Preprocessor
Text Books:
LIST OF EXERCISES

1. Simple C programs
2. Program to illustrate control statements
3. Program to illustrate FOR loop
4. Program to illustrate SWITCH & WHILE statements
5. Program to illustrate functions
6. Program to illustrate user-defined functions
7. Program to illustrate arrays
8. Program to illustrate usage of pointers
9. Program to illustrate character handling libraries.
10. Program to illustrate string manipulation
11. Program to illustrate creation of files & streams.
12. Program to illustrate creation, reading & accessing sequential & random files
DISCIPLE SPECIFIC CORE - 2

Paper Code: CSCA114

DIGITAL ELECTRONICS & COMPUTER ORGANIZATION

Prerequisite: Basic knowledge about computers

Objectives:
- To learn the fundamentals of digital system design.
- To learn combinational and sequential logic.
- To learn hardware fundamentals of computer design.

MODULE – I

MODULE – II

MODULE – III

MODULE – IV

MODULE – V
Memory System - Basic concepts, Semi-conductor RAM memories, Read-only memories, Speed, Size and Cost, Cache memories, Performance considerations, Virtual Memories, memory management requirements, Secondary Storage.
TEXT BOOKS:
LIST OF EXERCISES

1. Study of Logic Gates
2. Design of Adder and Subtractor
3. Design and Implementation of Code Convertors
4. Design of 4-Bit Adder and Subtractor
5. Design and Implementation of Magnitude Comparator
6. 16 Bit Odd/Even Parity Checker and Generator
7. Design and Implementation of Multiplexer and Demultiplexer
8. Design and Implementation of Encoder and Decoder
9. Design and Implementation of 3 Bit Synchronous Up/Down Counter
10. Design and Implementation of Shift Register
11. Simulation of Logic Gates
12. Simulation of Adder and Subtractor
13. Design of 4-Bit Adder and Subtractor
DISCIPLE SPECIFIC CORE - 3

Paper Code: CSCA123

PYTHON PROGRAMMING

Prerequisite: Knowledge of any programming language

Objectives:

- To learn about the fundamentals of computers
- To learn how to install Python, start the Python shell
- To learn to perform basic calculations, print text on the screen and create lists, and perform simple control flow operations using if statements and for loops
- To learn how to reuse code with functions

MODULE – I

Computer Systems - Python Programming Language Computational Thinking - Python Data Types - Expressions, Variables, and Assignments – Strings – Lists – Objects & Classes – Python standard library

MODULE – II

Imperative programming – Python modules – print() function – functional eval() - Execution Control Structures – user-defined functions python variables & assignments parameter passing

MODULE – III

Text Data, Files & Exceptions – Strings revisited – formatted output – files – errors & exceptions - Execution Control Structures – decision control & the IF statement

MODULE – IV

Container and Randomness – Dictionaries – other built-in container types – character encodings & strings – module random

MODULE – IV

FOR loop & Iteration Patterns – two-dimensional lists- while loop – more loop patterns – additional iteration control statements- namespaces – encapsulation in functions – global vs local namespaces exceptional flow control – modules as namespaces
TEXT BOOKS:

LIST OF EXERCISES

1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user’s choice.
2. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria:
   - Grade A: Percentage >=80
   - Grade B: Percentage>=70 and <80
   - Grade C: Percentage>=60 and <70
   - Grade D: Percentage>=40 and <60
   - Grade E: Percentage<40
3. Program, using user-defined functions to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
4. Program to display the first n terms of Fibonacci series.
5. Program to find factorial of the given number.
6. Program to find sum of the following series for n terms: 1 – 2/2! + 3/3! - - - - - n/n!
7. Program to calculate the sum and product of two compatible matrices.
8. Program to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula m=60/(t+2), where t is the time in hours. Sketch a graph for t vs. m, where t>=0.
9. A population of 1000 bacteria is introduced into a nutrient medium. The population grows as follows:
   \[ P(t) = \frac{15000(1+t)}{15+e} \]
   where the time t is measured in hours. WAP to determine the size of the population at given time t and plot a graph for P vs t for the specified time interval.
10. Input initial velocity and acceleration, and plot the following graphs depicting equations of motion:
    I. velocity wrt time (v=u+at)
    II. distance wrt time ( s=u*t+0.5*a*t^2)
    III. distance wrt velocity ( s=(v^2-u^2)/2*a )
Paper Code: CSCA124
DATA STRUCTURES & ALGORITHMS

Pre-requisite: Knowledge of any programming language

Objectives:
- To acquaint students with data structures used when programming for the storage and manipulation of data.
- The concept of data abstraction and the problem of building implementations of abstract data types are emphasized.
- Data Structure Algorithms for stack, queues, linked list, trees, graphs, sorting and searching.

MODULE-I
Definition of a Data structure - primitive and composite Data Types, Arrays, Operations on Arrays, Ordered lists - Stacks - Operations - Applications of Stack - Infix to Postfix Conversion.

MODULE-II

MODULE-III
Trees: Binary Trees - Operations - Graph - Definition, Types of Graphs, Graph Traversal - DFS and BFS.

MODULE-IV

MODULE - V
Role of algorithms in computing - Sorting and Searching Techniques - Elementary sorting techniques –Bubble Sort, Insertion Sort, Merge Sort, Quick Sort

TEXT BOOKS
LIST OF EXERCISES

1. Implementation of stack
2. Implementation of Queue
3. Implementation of Singly Linked List
4. Implementation of Doubly linked list
5. Implementation of Binary tree and traversals (BFS & DFS)
6. Implementation of Insertion sort
7. Implementation of Selection Sort
8. Implementation of Quick sort
9. Implementation of Merge sort
10. Implementation of Infix to Postfix & Infix to Prefix notations.
DISCIPLE SPECIFIC CORE – 5

Paper Code: CSCA231
PROGRAMMING WITH VISUAL BASIC

Pre-requisite: Knowledge of any programming language

Objectives:
1. To introduce the students to Event Driven programming.
2. To help the students in find solutions to real life problems using Visual Basic.
3. Students will learn about connecting and accessing databases.

MODULE –I

MODULE –II
Adding code and using events: Using literals – data types - declaring and using variables – using the operator – subroutines and functions – looping and decision control structures – if then else structure – select structure , for next, do.. loop and while.. wend.- Using intrinsic Visual basic Controls with methods and Properties: Label ,Text box, Command button, Frame, Checkbox, option button, List box, Combo box, Drive List box, directory List box and file list box – Formatting controls – control arrays, Tab order

MODULE –III
Functions and Procedure - Passing arguments by value and reference – Arrays, dynamic arrays – User defined data types – symbolic constants – using Dialog boxes: Input box, Message box functions - String functions, date and Time function, numeric functions

MODULE –IV
Menus: creating menus, adding code to menus, using MDI forms - MDI form basic – building MDI form – creating MDI Child Forms

MODULE –V
Database object (DAO) and properties – accessing Recordset objects – Move first, MoveLast, MovePrevious and MoveNext methods – accessing Microsoft Access files. Active Data Objects (ADO) ADO and OLE DB – Connecting to the database – Retrieving a recordset - Adding records – Editing records – closing the database connection.
TEXT BOOKS

4. Eric A. Smith, Valar Whisler, and Hank Marquis “Visual Basic 6 programming”
DISCIPLE SPECIFIC CORE – 6

Paper Code: CSCA232
DATABASE MANAGEMENT SYSTEMS

Prerequisite: Knowledge of data structures and file-handling

Objectives:

- To learn about the basics of database management systems (DBMS), with an emphasis on how to organize, maintain and retrieve efficiently, and effectively the information from a DBMS.
- To learn the fundamental concepts of the relational model, including relations, attributes, domains, keys, foreign keys, entity integrity and referential integrity.
- To learn how to normalize the data using 1st, 2nd & 3rd normal forms
- To define and manipulate the relational databases in SQL.

MODULE - I

MODULE - II
Entity-Relationship Model - Introduction, the building blocks of an entity relationship diagram, classification of entity sets, attribute classification, relationship degree, relationship classification, reducing ER diagram to tables, enhanced entity-relationship model (EER model), generalization and specialization, ISA relationship and attribute inheritance, multiple inheritance, constraints on specialization and generalization, aggregation and composition - advantages of ER modeling.

MODULE - III

MODULE - IV
Structured Query Language - Introduction, History of SQL Standard, Commands in SQL, Data Types in SQL, Data Definition Language, Data Manipulation Language, Data Control Language - Table Modification Commands – primary & foreign keys

MODULE - V
PL/SQL: Introduction, Shortcoming in SQL, Structure of PL/SQL, PL/SQL Language Elements, Data Types, Operators Precedence, Control Structure, steps to Create a PL/SQL, steps to create a Cursors, Procedure, Function, Packages, Exceptions Handling, Database Triggers, Types of Triggers.

TEXT BOOKS

LIST OF EXERCISES:

Unit – I (Visual Basic)

1. Building simple applications
2. Working with intrinsic controls and ActiveX controls
3. Application with multiple forms
4. Application with dialogs
5. Application with Menus
6. Application using data controls
7. Application using Common Dialogs
8. Drag and Drop Events
9. Database Management
10. Creating ActiveX Controls

Unit – II (SQL)

Use the concepts like data normalization, link between table by means of foreign keys and other relevant database concepts for the following applications. The implementation of each should have necessary input screen (forms) Menu-driven query processing and reports. Necessary validations should be made for each table

1. Library information system
2. Students mark sheet processing
3. Telephone directory maintenance
4. Gas booking and delivering
5. Electricity bill processing
6. Bank Transaction
7. Pay roll processing
8. Personal information system
9. Question database and conducting Quiz
10. Personal diary
Prerequisite: Basic Knowledge of Computers

Objectives:

1. Given an environment, after analyzing the channel characteristics, appropriate channel access mechanism and data link protocols are chosen to design a network.
2. Given an environment, analyzing the network structure and limitations, appropriate routing protocol is chosen to obtain better throughput.
3. Given various load characteristics and network traffic conditions, decide the transport protocols and timers to be used.

MODULE –I
Introduction to Networks – Topology - Network Architecture - Reference Models - Example Networks – Transmission Medias

MODULE –II

MODULE –III

MODULE –IV
Application layer - Domain Naming System - DNS Namespace, Resource Records, Name Servers - Electronic mail - Architecture and Services, The User Agent, Messages Formats, Message Transfer

MODULE –V

TEXT BOOK
LIST OF EXERCISES:

1. Implementation of Error Detection / Error Correction Techniques
2. Implementation of Stop and Wait Protocol and sliding window
3. Implementation and study of Go back-N and selective repeat protocols
4. Implementation of High Level Data Link Control
5. Study of Socket Programming and Client – Server model
6. Write a socket Program for Echo/Ping/Talk commands.
7. To create scenario and study the performance of network with CSMA / CA Protocol and compare with CSMA/CD protocols.
8. Network Topology - Star, Bus, Ring
9. Implementation of distance vector routing algorithm
10. Implementation of Link state routing algorithm
11. Encryption and decryption.
SOFTWARE ENGINEERING

Pre-requisite: Basic knowledge of programming

Objectives:
- Identify, formulate, and solve software engineering problems, including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements
- Elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of a software project.
- Need to function effectively as a team member
- Understanding professional, ethical and social responsibility of a software engineer
- Participate in design, development, deployment and maintenance of a medium scale software development project.

MODULE – I

MODULE – II
Software Requirements: Analysis & Specifications – requirements engineering – type of requirements – feasibility studies – requirements elicitation – requirement analysis – requirement documentation – requirement validation – requirement management – Case studies

MODULE – III
Software Project Planning – size estimation – cost estimation – models – Constructive cost model – software risk management – software design – what is design – modularity – strategy of design – function oriented design - object oriented design

MODULE – IV

**MODULE – V**

Software testing – strategic approach to software testing – terminologies – functional testing – structural testing – levels of testing – validation testing – the art of debugging – testing tools

**TEXT BOOK:**

Paper Code: CSCA241
OPERATING SYSTEMS

Pre-requisite: Knowledge of computers & computer organization

Objectives:
- To learn Structure and functions of OS
- To learn Processes and Threads, Scheduling algorithms
- To learn Principles of concurrency and Memory management
- To learn I/O management and File systems

MODULE - I

MODULE - II

MODULE - III

MODULE - IV
MODULE - V

TEXT BOOKS:
DISCIPLE SPECIFIC CORE – 10

Paper Code: CSCA242

OBJECT ORIENTED PROGRAMMING USING JAVA

Prerequisite: Basic Knowledge of programming

Objectives:

- On successful completion of the course the students should have understood the object oriented programming in java
- Should have idea about GUI bases programming
- Should have idea about database programming

MODULE – I
Introduction – Introduction to java applications – Introduction to classes, objects, methods & Strings - Control statements - Arrays

MODULE – II
Class & Objects – constructor – function overloading & overriding - Inheritance - Polymorphism – Interface – package - exception handling - Introduction to Multithreading

MODULE – III

MODULE – IV
Files, Streams & Object Serialization – Introduction – Files & Streams – Sequential Access Text Files – Object Sterilization

MODULE – V
Text Books:
LIST OF EXERCISES

1. Program to illustrate various date types in Java.
2. Program to illustrate class and objects.
3. Program to illustrate control structures (if-then, while, switch).
4. Program to illustrate the concept of arrays (creation, initialization and processing).
5. Program to illustrate Multidimensional arrays.
6. Program to illustrate Constructor and its overloading.
7. Program to illustrate Inheritance and Packages.
8. Program to illustrate Interface and static methods.
9. Program to illustrate modifiers protected, this, final and super.
10. Program to illustrate Exception Handling Technique.
11. Program to illustrate input/output streams.
12. Program to illustrate File handling technique.
13. Program to illustrate threading.
14. Program to illustrate simple Java applets.
15. Program to illustrate database programming
DISCIPLE SPECIFIC CORE – 11

Paper Code: CSCA351

VISUAL PROGRAMMING USING C#

Prerequisite: Knowledge of C language and DBMS

Objectives:
- To understand the various types of applications
- To get expertise in visual programming
- To understand the functionalities of middleware platform

MODULE – I

MODULE – II
Introduction to Classes and Objects – Introduction - Classes, Objects, Methods, Properties and Instance Variables - Declaring a Class with a Method and Instantiating an Object of a Class - Declaring a Method with a Parameter - UML Class Diagram with a Property - Software Engineering with Properties and set and get Accessors - Initializing Objects with Constructors - Floating-Point Numbers and Type decimal - Control Statements

MODULE – III
Classes and Objects: A Deeper Look – Introduction - Controlling Access to Members - Referring to the Current Object’s Members with the this Reference – Indexers - Default and Parameterless Constructors – Composition - Garbage Collection and Destructors- static Class Members - Data Abstraction and Encapsulation - Object Initializers – Delegates Object-Oriented Programming: Inheritance - Polymorphism, Interfaces and Operator Overloading-Exception Handling

MODULE – IV
Handling – Menus- various controls - Multiple Document Interface (MDI) Windows - Visual Inheritance - User-Defined Controls

MODULE – V
Databases and LINQ - Introduction - relational Databases - LINQ to SQL - Querying a Database with LINQ - Dynamically Binding Query Results - Retrieving Data from Multiple Tables with LINQ - Creating a Master/Detail View Application - Tools and Web Resources Case Study

TEXT BOOK:
VISUAL PROGRAMMING LAB

LIST OF EXERCISES

1. Implement Classes and Objects, Inheritance & Polymorphism
2. Implement Interfaces, Operator Overloading, Delegates and Events
3. Implement Exception Handling & Multi-Threaded
4. Create Console application & Window Applications.
5. Create programs using SDI & MDI
6. Create program using Database Controls
7. Develop any TWO case studies listed below:
   I. Inventory Control
   II. Retail Shop Management
   III. Employee Information System
   IV. Personal Assistant Program
   V. Students’ Information System
Pre-requisite: Knowledge of Operating system, computer network, DBMS, and Java language.

Objectives:
- To inculcate knowledge of web technological concepts and functioning of internet
- To learn and program features of web programming languages.
- To understand the major components of internet and associated protocols.
- To design an innovative application for web.

MODULE – I

MODULE - II

MODULE – III

MODULE – IV
Server-Side Programming: Java Servlets- Model-View-Controller Paradigm - Servlet Architecture Overview - Servlets Generating Dynamic Content - Servlet Life Cycle - Parameter Data
MODULE – V
Sessions - Cookies - URL Rewriting - Servlets and Concurrency – database programming using Servlet.

TEXT BOOK:
LIST OF EXERCISES

1. Creation of HTML Files
2. Working with Client Side Scripting
   2.1 JavaScript
3. Configuration of web servers
   3.1 Apache Web Server
   3.2 Internet Information Server (IIS)
4. Experiments in Servlet
   4.1 Implementing MVC Architecture using Servlets
   4.2 Data Access Programming (using ADO)
   4.3 Session and Application objects
   4.4 File System Management
5. Write programs in Java to create three-tier applications using servlets
   5.1 for conducting on-line examination.
   5.2 for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.
The objective of the project is to motivate them to work in emerging/latest technologies, help the students to develop ability, to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories.

The project is of 2 hours/week for one (semester VI) semester duration and a student is expected to do planning, analyzing, designing, coding, and implementing the project. The initiation of project should be with the project proposal. The synopsis approval will be given by the project guides.

The project proposal should include the following:

- Title
- Objectives
- Input and output
- Details of modules and process logic
- Limitations of the project
- Tools/platforms, Languages to be used
- Scope of future application

The project work should be either an individual one or a group of not more than three members and submit a project report at the end of the semester. The students shall defend their dissertation in front of experts during viva-voce examinations.
GENERAL ELECTIVE –I PAPER I

Paper Code: CSCA125
MATHEMATICS FOR BUSINESS

OBJECTIVES:
  • To enable students to learn and apply mathematics skills to a business setting.

MODULE - I
Ratio, Proportion and Percentage, Ratio- Definition, Continued Ratio, Inverse Ratio, Proportion, Continued Proportion, Direct Proportion, Inverse Proportion, Variation, Inverse Variation, Joint Variation, Percentage- Meaning and Computations of Percentages.

MODULE - II

MODULE - III
Interest -Simple Interest, Compound interest (reducing balance & Flat Interest rate of interest), Equated Monthly Installments(EMI), Problems

MODULE - IV
Matrices and Determinants (upto order 3 only)-Multivariable data, Definition of a Matrix, Types of Matrices, Algebra of Matrices, Determinants, Ad joint of a Matrix, Inverse of a Matrix via ad joint Matrix, Homogeneous System of Linear equations, Condition for Uniqueness for the homogeneous system, Solution of Non-homogeneous System of Linear equations (not more than three variables). Condition for existence and uniqueness of solution, Solution using inverse of the coefficient matrix, Problems.

MODULE - V
REFERENCE BOOKS:
1. Business Mathematics by Dr. Amarnath Dikshit & Dr. Jinendra Kumar Jain.
2. Business Mathematics by V. K. Kapoor - Sultan chand & sons, Delhi
3. Business Mathematics by Bari - New Literature publishing company, Mumbai
GENERAL ELECTIVE –I  PAPER II

Paper Code: CSCA126

PROBABILITY AND STATISTICS

Prerequisite: Knowledge in basic mathematics

Objectives:

- To learn how to handle situations involving more than one random variable and functions of random variables.
- To learn the notion of sampling distributions and have acquired knowledge of statistical techniques useful in making rational decision in management problems.
- To learn statistical methods designed to contribute to the process of making scientific judgments in the face of uncertainty and variation.

MODULE – I


MODULE – II


MODULE – III

Mathematical Expectation - Definition of Mathematical Expectation - Functions of Random Variables - Theorems on Expectation - Variance & Standard Deviation - Theorems on Variance - Standardized Random Variables - Special Probability Distributions - Binomial Distribution - Normal Distribution - Poisson Distribution

MODULE – IV

STATISTICS - Sampling Theory - Population and Sample - Statistical Inference - Sampling With and Without Replacement Random Samples - Random Numbers - Population Parameters - Sample Statistics - Sampling Distributions - Sample Mean - Sampling Distribution of Means - Sampling Distribution of Proportions - Sampling Distribution of Differences and Sums - Sample Variance - Sampling Distribution of Variances - Computation of Mean, Variance, and Moments for Grouped Data

MODULE – V

Curve Fitting, Regression, Correlation - Curve Fitting – Regression - The Method of Least Squares The Least-Squares Line - The Least-Squares Line in Terms of Sample Variances and Covariance - The Least-Squares Parabola - Multiple Regression Standard Error of Estimate The Linear Correlation Coefficient Generalized Correlation Coefficient Rank Correlation
Text books:
2. S. P. Gupta, Statistical Methods, S. Chand and Sons.
# GENERAL ELECTIVE –II PAPER I

**Paper Code:** CSCA235  
**DISCRETE MATHEMATICS**  

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**OBJECTIVES:**
1. Ability model data sets as mathematical functions and solve.
2. Ability to understand and model the discrete structures such as graphs and trees.

**MODULE –I**

**MODULE –II**

**MODULE –III**

**MODULE –IV**

**MODULE –V**

**TEXT BOOKS**
2. Narsingh Deo, “Graph Theory with applications to Engineering and Computer Science”, PHI, 1997. (Unit – 4, 5)
GENERAL ELECTIVE –II PAPER II

Paper Code: CSCA236

OPERATIONS RESEARCH

OBJECTIVES:
1. Ability to analyze the given data set using mathematical models.
2. Ability to represent the dataset and solve using techniques such as linear programming, Game theory, PERT and CPM.

MODULE –I
Introduction to Operations Research - Principal components of decision problems - phases of OR study.

MODULE –II
Linear Programming - graphical solution - simplex method including artificial variable technique - duality.

MODULE –III
Transportation and assignment models - Sequencing

MODULE –IV
Game theory - optimal solution of two-person zero-sum games - mixed strategies - graphical solution of (2 X n) and (m X 2) games - solution of (m X n) games by linear programming.

MODULE – V
PERT and CPM - network diagrams - determination of the floats and critical path - probability considerations in project scheduling.

TEXT BOOKS
1. Treatment as in Hamdy A.Taha “Operations Research - An introduction (III edition)”, chapters 1, 2, 3 (omit 3.4), 4 (omit 4.4, 4.5), 5 (omit 5.4), 11 (omit all sections except 11.4 only), 12 (omit 12.3, 12.5).
2. R.L. Ackoff and M.W.Sasieni ”Fundamentals of O.R.”, (For Sequencing)
DISCIPLE SPECIFIC ELECTIVE
SPECIALIZATION STREAM I (BUSINESS INTELLIGENCE) – PAPER I

Paper Code: CSCA243
DATA WAREHOUSING

Pre-requisite: Knowledge of database management system

Objectives:
- To learn the fundamentals of designing large-scale data warehouses using relational technology.
- To study the design aspects, planning and development.

MODULE - I

MODULE - II

MODULE - III
Hardware and operational design – server hardware, network hardware – parallel technology – Security input on design of Hardware – backup and recovery – Service level Agreement – Operating the data warehouse.

MODULE IV

MODULE - V
Case Studies - Data Warehousing in the Tamil Nadu Government - Data Warehouse for the Ministry of commerce- Data Warehouse for the government of Andhra Pradesh- Data Warehousing in Hewlett –Packard- Data Warehousing in Levi Strauss- Data Warehousing in the World Bank- HARBOR, A Highly available Data Warehouse-A typical Business data Warehouse for a Trading company.
TEXT BOOKS:

1. Sam Anahory & Dennis Murray, “Data Warehousing in the real world”, Pearson Education.

DISCIPLE SPECIFIC ELECTIVE – STREAM I – PAPER II

Paper Code: CSCA353
DATA MINING

Prerequisite: Knowledge of database management system

Objectives:
- To understand the concepts of Data Mining.
- To learn about Classification, prediction and cluster analysis techniques.
- To learn about applications of Data and knowledge mining.

MODULE - I
An Introduction to Data Mining - Introduction - The Data Mining Process - The Basic Data Types - The Major Building Blocks - Association Pattern Mining- Data Clustering - Outlier Detection- Data Classification - Impact of Complex Data Types on Problem Definitions- Scalability Issues and the Streaming Scenario - Some Application Scenarios

MODULE – II
Data Preparation – Introduction - Feature Extraction and Portability- Data Cleaning - Data Reduction and Transformation

MODULE – III
Similarity and Distances- Introduction- Multidimensional Data- Text Similarity Measures - Temporal Similarity Measures - Graph Similarity Measures- Supervised Similarity Functions

MODULE – IV

MODULE – V
Cluster Analysis – Introduction - Feature Selection for Clustering - Representative-Based Algorithms - Hierarchical Clustering Algorithms - Cluster Validation Clustering Categorical Data - Outlier Analysis – Introduction - Extreme Value Analysis - Clustering for Outlier Detection - Distance-Based Outlier Detection

TEXT BOOK:
DISCIPLE SPECIFIC ELECTIVE – STREAM I – PAPER III

Paper Code: CSCA363
FOUNDATIONS OF DATA ANALYTICS

OBJECTIVES:
• To learn to explore data, sample and model them
• To understand R language
• To generate reports

MODULE - I
Introduction to Data Science - Data science process – roles, stages in data science project –
working with data from files – working with relational databases – exploring data – managing
data – cleaning and sampling for modeling and validation – introduction to NoSQL.

MODULE - II
Modeling Methods - Choosing and evaluating models – mapping problems to machine learning,
evaluating clustering models, validating models – cluster analysis – K-Means algorithm, Naïve
Bayes – Memorization Methods – Linear and logistic regression – unsupervised methods.

MODULE - III
Introduction to R - Language: Reading and getting data into R – ordered and unordered factors –
avarrays and matrices – lists and data frames – reading data from files – probability distributions –
statistical models in R - manipulating objects – data distribution.

MODULE - IV
Map Reduce: Introduction – distributed file system – algorithms using map reduce, MatrixVector
Multiplication by Map Reduce – Hadoop - Understanding the Map Reduce architecture - Writing
Hadoop Map Reduce Programs - Loading data into HDFS – Executing the Map phase.

MODULE - V
Delivering Results - Documentation and deployment – producing effective presentations–
Introduction to graphical analysis – plot() function – displaying multivariate data – matrix plots –
multiple plots in one window - exporting graph - using graphics parameters. Case studies.

TEXT BOOKS:

DISCIPLE SPECIFIC ELECTIVE
SPECIZATION STREAM II (ARTIFICIAL INTELLIGENCE) – PAPER I

Paper Code: CSCA244
ARTIFICIAL INTELLIGENCE

Pre-requisite: Knowledge of predicate calculus and programming
Objectives:

- To study the concepts of Artificial Intelligence and Methods of solving problems using Artificial Intelligence
- To understand the basic techniques of knowledge representation and their use and components of an intelligent agent
- To be able to implement basic decision making algorithms, including search based and problem solving techniques, and first-order logic.
- To know the basic issues in machine learning

MODULE - I
Introduction to AI & Production Systems - Introduction - AI problems, foundation of AI and history of AI intelligent agents - Agents and Environments - the concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

MODULE - II

MODULE - III
Representation of Knowledge - Knowledge Representation & Reasons logical Agents, Knowledge – based Agents, the Wumpus world, logic, propositional logic, Resolution patterns in propositional logic, Resolution, Forward & Backward Chaining

MODULE - IV
First order logic - Inference in first order logic, propositional vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution - Learning - Learning from observations – forms of learning

MODULE - V
An Overview of Prolog - An example program: defining family relations - Extending the example program by rules - A recursive rule definition - How Prolog answers questions -
Declarative and procedural meaning of programs - Syntax and Meaning of Prolog Programs - Lists, Operators, Arithmetic - Using Structures: Example Programs

**TEXT BOOKS:**

NEURAL NETWORKS

Pre-Requisite: Knowledge of Artificial Intelligence

Objectives:
- To understand the Concept of Artificial Neural Networks
- To study various algorithms and their implementation in real life and in different domains

MODULE I
Introduction - Overview of biological neurons: Structure of biological neurons relevant to Artificial Neural Networks (ANNs).

MODULE II
Learning Process – Supervised, Unsupervised and reinforced - Error Correction Learning, Memory based learning, Hebbian learning rule, The Boltzman machine, Competitive learning, Credit assignment problem, memory, adaptation, statistical nature of learning process.

MODULE III
Single layer Perceptrons: Classification model, Features & Decision regions; training & classification using discrete perception, algorithm, single layer continuous perception networks for linearly separable classifications.

MODULE IV
Multi-layer Feed Forward Networks: linearly non-separable pattern classification, Delta learning rule for multi-perceptron layer, generalized delta learning rule, Error back propagation training, learning factors, Examples.

MODULE V
Single layer feedback Networks: Basic Concepts, Hopfield networks, Training & Examples, associative memories
**TEXT BOOKS:**

3. B. Yegna Narayana, “Artificial Neural Networks”, 2006, PHI
DISCIPLE SPECIFIC ELECTIVE – STREAM II – PAPER III

Paper Code: CSCA364
SOFT COMPUTING

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PRE-REQUISITE: Knowledge in Neural Networks

OBJECTIVES:
- To introduce about incorporating more mathematical approach (beyond conventional logic system) into the artificial intelligence approaches for problem solving such as fuzzy logic, genetic algorithms, etc.

MODULE I

MODULE II
NEURAL NETWORKS: Different architectures; back-propagation algorithm; hybrid learning rule; supervised learning - perceptrons, back -propagation multilayer perceptrons, radial basis function networks; unsupervised learning –competitive learning network, Kohonen self-organizing networks, the Hopfield network.

MODULE III
FUZZY SET THEORY: Basic definition and terminology; basic concepts of fuzzy logic; set theoretic operators; membership functions: formulation and parameterization; fuzzy union, intersection and complement; fuzzy rules and fuzzy reasoning; fuzzy inference systems: Mamdani and Sugeno fuzzy models.

MODULE IV
NEURO-FUZZY MODELLING: Adaptive neuro-fuzzy inference systems; neuro-fuzzy controller-feedback control; Back propagation through time and realtime recurrent learning; gradient-free optimization.

MODULE V
GENETIC ALGORITHMS: Genetic algorithm, Fundamentals, basic concepts, working principle, encoding, fitness function, reproduction, Genetic modeling: Inheritance operator, cross
over, inversion & deletion, mutation operator, Bitwise operator, Applications & advances in GA, Differences & similarities between GA & other traditional method

TEXT BOOKS
PRINCIPLES OF INFORMATION SECURITY

Prerequisite: Basic knowledge of computers

Objectives:

- To provide an understanding of principal concepts, major issues, technologies and basic approaches in information security.
- Develop an understanding of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.
- Gain familiarity with prevalent network and distributed system attacks, defenses against them and forensics to investigate the aftermath.

MODULE – I

MODULE – II

MODULE – III

MODULE – IV

MODULE – V

**TEXT BOOK:**

CRYPTOGRAPHY AND NETWORK SECURITY

Prerequisite: Knowledge of mathematics, information security & computer networks.

Objectives:

- To learn about network security
- To learn Computer Network Vulnerabilities
- To learn how to deal with Network Security Challenges
- Develop a basic understanding of cryptography, how it has evolved and some key encryption techniques used today.
- Develop an understanding of security policies (such as authentication, integrity and confidentiality)
- To learn about network security threats and countermeasures

MODULE – I

MODULE – II

MODULE – III
Computer Network Vulnerabilities - Sources of Vulnerabilities- Vulnerability Assessment - Cyber Crimes and Hackers - Cyber Crimes – Hacker - Dealing with the Rising Tide of Cyber Crimes

MODULE – IV
MODULE – V


TEXT BOOKS:

Prerequisite: Knowledge of cryptography & information security

Objectives:

- To understand how intruders escalate privileges in a system.
- To understand Intrusion Detection, Policy Creation, Social Engineering, DDoS Attacks, Buffer Overflows and Types of Attacks and Protections.
- To learn Classification and Mechanism of Ethical Hacking.
- To learn the basic principles, instrumentation and applications of Ethical Hacking.

MODULE I

MODULE II

MODULE III

MODULE IV
Routers, Firewall & Honeypots, IDS & IPS, Web Filtering, Vulnerability, Penetration Testing, Session Hijacking, Web Server, SQL Injection, Buffer Overflow, Reverse Engineering, Email Hacking, Incident Handling & Response, Bluetooth Hacking, Mobile Phone Hacking
MODULE V
Social Engineering, Host Reconnaissance, Session Hijacking, Hacking - Web Server, Database, Password Cracking, Network and Wireless, Trojan, Backdoor, UNIX, LINUX, Microsoft, Buffer Overflow, Denial of Service Attack.

TEXT BOOKS:
DISCIPLE SPECIFIC ELECTIVE
SPECIALIZATION STREAM IV (WIRELESS COMMUNICATIONS) – PAPER I

Paper Code: CSCA246

WIRELESS COMMUNICATION TECHNOLOGIES

Pre-Requisite: Data Communication and Networks

Objectives:
- To know about the various frequency Spectrum and Signals for wireless communication
- To know the concept of Infrared, Cordless and WLL
- To understand the concepts wireless communication technologies such as Wireless LAN, WiMAX, Bluetooth and Wi-Fi

MODULE –I

MODULE –II

MODULE –III

MODULE –IV
MODULE –V

TEXT BOOKS

REFERENCES
INTRODUCTION TO MOBILE COMMUNICATION

Pre-Requisite: Knowledge in Wireless communication Technologies.

Objectives:
- To understand the concepts of Telecommunication Systems such as GSM, DECT, TETRA, UMTS and UTRAN.
- To understand the Mobile Network Layer and Transport Layer.

MODULE I

MODULE II

MODULE III
Broadcast systems – Overview, Cyclical repetition of data, Digital audio broadcasting, Multimedia object transfer protocol, Digital video broadcasting, DVB data broadcasting, DVB for high-speed internet access, Convergence of broadcasting and mobile communications

MODULE IV
Mobile communications - Radio layer Baseband layer Link manager protocol L2CAP Security SDP Mobile network layer - Mobile IP, Goals, assumptions and requirements, Entities and terminology, IP packet delivery, Agent discovery, Registration, Tunneling and encapsulation, Optimizations, Reverse tunneling, IPv6, IP micro-mobility support.

MODULE V
TEXT BOOK

   (Chapter 1, 4, 5, 6, 8.1, 9)
INTERNET OF THINGS

**Pre-Requisite:** Knowledge in Wireless and mobile communication Technologies.

**Objectives:**
- Vision and Introduction to IoT.
- Understand IoT Market perspective.
- Data and Knowledge Management and use of Devices in IoT Technology.
- Real World IoT Design Constraints, Industrial Automation and Commercial Building Automation in IoT.

**MODULE- I**

M2M to IoT-The Vision-Introduction, From M2M to IoT, M2M towards IoT-the global context, A use case example, Differing Characteristics.

**MODULE- II**


**MODULE- III**

M2M and IoT Technology Fundamentals- Devices and gateways, Local and wide area networking, Data management, Business processes in IoT, Everything as a Service(XaaS), M2M and IoT Analytics, Knowledge Management

**MODULE- IV**


**MODULE- V**

Automation- Introduction, Case study: phase one-commercial building automation today, Case study: phase two- commercial building automation in the future.

TEXT BOOK:

REFERENCE BOOKS:
Disciple Specific Elective
Specialization Stream V (Software Engineering) – Paper I

Paper Code: CSCA247

IT Project Management

Pre-Requisite: Knowledge in Software Engineering

Objectives:

- To understand the Nature of IT projects
- To design Project plans and write Project proposals.
- To understand the Project Development Life Cycle.

Module – I

The Nature of Information Technology Projects – Conceptualizing the IT Project - Developing the Project Charter and Baseline Project Plan

Module – II

The Human Side of Project Management - Defining and Managing Project Scope

Module – III

The Work Breakdown Structure and Project Estimation - The Project Schedule and Budget - Managing Project Risk

Module – IV

Project Communication, Tracking and Reporting – IT Project Quality Management

Module – V

Managing Organizational Change, Resistance and Conflict – Project Implementation, Closure and Evaluation.

Text Book

SOFTWARE TESTING

PRE-REQUISITE:  Knowledge in Software Engineering, Project Management

Objectives:
- To understand the Concepts of Software Testing.
- Introducing the students to various Testing Strategies and Testing Tools.

MODULE I
Introduction: Software-Testing, Terminology and Methodology, Verification and Validation.

MODULE II

MODULE III

MODULE IV
Testing Object Oriented Software - Testing Web Based Systems - Debugging.

MODULE V

REFERENCES:
DISCIPLE SPECIFIC ELECTIVE – STREAM V – PAPER II

Paper Code: CSCA367

SOFTWARE QUALITY MANAGEMENT

Prerequisite: Knowledge of software engineering

Objectives

- To learn quality assurance plans
- To learn how to apply quality assurance tools & techniques
- To learn about standards and certifications
- To learn how to describe procedures and work instructions in software organizations

MODULE - I

MODULE - II

MODULE - III
Software Quality Infrastructure Components - Procedures and Work Instructions – Supporting Quality Devices - Staff Training - Instructing and Certification - Preventive and Corrective Actions – Configuration Management - Documentation and Quality Records Controls.

MODULE - IV
Software Quality Management Components - Project Progress Control - components of project progress control- Progress control of internal projects and external participants- Implementation of project progress control

MODULE - V
TEXT BOOKS:


OPEN ELECTIVE -1
SPECIALIZATION STREAM (MANAGEMENT) – PAPER I

Paper Code: CSCA248

FUNDAMENTALS OF ACCOUNTANCY

Pre-requisites: Basic knowledge in mathematics

Objectives:
- To understand the basic Accountancy.
- To understand concepts of cash maintenance and Cost Accounting.

MODULE -I

MODULE - II
Double entry system-personal accounts, real accounts, nominal accounts-journal-ledger-preparation of trial balance-rectification of errors.

MODULE –III
Subsidiary books including cash book, bank Reconciliation statement

MODULE –IV
Preparation of trading account- preparation of profit and loss account and balance sheet- Final accounts with adjustments

MODULE –V

Ratio Analysis – Liquidity ratios – activity ratios – structural ratios – Profitability ratios – dupont analysis

TEXT BOOKS
3. Pillai and Baghawati, “Cost Accounting”

**Note:**

Theory 20 Marks; Problem 80 Marks
OPEN ELECTIVE - 1 – PAPER II

Paper Code: CSCA249

FINANCIAL MANAGEMENT

Pre-requisite: Basic knowledge in mathematics and accounts

Objectives:
- To understand the Indian financial systems and stock market
- To understand the financial services and financial management.

MODULE –I

MODULE –II
Stock exchange – functioning – SEBI – Powers and functions of SEBI – Merchant banking underwriting – stock broking and trading systems - OTCEI

MODULE –III
Management of financial services – Factoring – Forfeiting – Leasing – credit and credit rating – Mergers, restructuring takeovers – venture capital financing – project financing

MODULE –IV

MODULE –V
Working capital management – Operating cycle – Inventory management – EOQ – Cash management – Accounts receivables management

TEXT BOOKS
2. I. M. Pandey, “Financial Management”, Vikas New Delhi
5. Ramachandran & Srinivasan, “Management Accounting – Theory & practice”

Note:
Theory 60 Marks; Problem 40 Marks
OPEN ELECTIVE - 2 - PAPER I

Paper Code: CSCA358

PRINCIPLES OF MANAGEMENT

OBJECTIVES:

1. To understand the importance and functions of management
2. To understand the purpose of planning and leadership

MODULE –I
Meaning, Definition and importance of Management-Functions of a Manager-Management process- Role of a Manager-Social responsibility of Management-Co-Ordination-Meaning and scope requirements of effective co-ordination-problems in co-ordination.

MODULE –II
Meaning and purpose of planning – steps in planning Process-Limitations-Types of plans, objectives, Strategies, policies, procedures, programmes, management by objectives (MBO) – Decision making- Types of decisions-process of decision making-difficulties in decision making

MODULE –III
Nature and purpose of organizations-different forms of organizations-merits and demerits – linear and staff concepts- organisational charts- departmentations - bases for departmentation - product, function and territory-span of management

MODULE –IV
Authority-responsibility-accountability-delegation of authority-principles of delegation-unity of command – centralization and decentralization –advantages and disadvantages

MODULE –V

TEXT BOOK
INTRODUCTION TO E-BUSINESS

OBJECTIVES
• This course introduces students to various aspects and models for e-business.
• At the end of the course, students should have an understanding of the impacts which e-business is having on society, markets and commerce.
• Students should also become aware of the global nature of e-commerce and how traditional means of doing business will need to change in the electronic age.

MODULE I

MODULE II
E-Marketplaces: Structures, Mechanisms, Economics, and Impacts- Define e-Marketplace and Describe their Functions- Explain e-Marketplace types and their features - Describe the various types of auctions and list their characteristics - Discuss the benefits, limitations and impacts of auctions - E-Commerce in the wireless environment - Competition in the DE and impact on industry

MODULE III
e-Business Applications, e-Procurement and e-Payment Systems - Integration and e-Business suits - ERP, eSCM, CRM - e-Procurement definition, processes, methods and benefits - e-Payment - Discuss the categories and users of smart cards - Describe payment methods in B2B EC.

MODULE IV

MODULE V
e-Learning and Online Education- Define electronic learning-Discuss the benefits and drawbacks of e-Learning.
The e-Learning Industry- Discuss e-Content development and tools-Describe the major technologies used in e-Learning- Discuss the different approaches for e-Learning delivery-How e-Learning can be evaluated. Future Trends-e-Government- Definition of e-Governments-Implementation-E-Government Services- Challenges and Opportunities- E-Government Benefit.

TEXT BOOK

REFERENCES
SKILL ENHANCEMENT COURSES

Paper Code: CSCA201

OFFICE AUTOMATION TOOLS

OBJECTIVES:
1. To practically learn to use Microsoft word, excel and powerpoint
2. To be able to work as an office assistant

MODULE – I

MODULE – II
MS-EXCEL: Creating a Simple Spreadsheet – Editing a Spreadsheet – Working with Functions and Formula – Formatting Worksheets – Completing Your Spreadsheet – Creating Charts

MODULE – III
MS-POWERPOINT: Creating and Viewing Presentations – Editing a Presentation – Working with Presentation Special Effects

TEXT BOOK:
1. Microsoft Office XP – fast & easy, DIANE KOERS Publisher: Prentice Hall of India Private Limited, New Delhi, 2001
MULTIMEDIA TOOLS

OBJECTIVES:

- Understanding the key principles of animation using FLASH.
- Understanding the concept of timing for animation and its application as a means of communication.
- Ability to creatively manipulate frame time as a means of emphasizing and actualizing action and expressing an idea.

MODULE – I
Flash - Action Scripting Using actions to control a timeline - Using frame labels - Creating button symbols - Creating animated buttons using movie clips – Movie Clip Controls – Browser / network.

MODULE - II
Advanced Animation Methods Creating movies playing within movies (movie clips and .swf) - Controlling multiple timelines (movies) through action scripting - Critique storyboards.

MODULE - III
Streamlining Files for Use on the Web, Publishing Files to the Internet & Pre loaders Pre loaders - Controlling sound with script - Exploring types of output - Work on final project in class - Importing video - Publishing demo (video) reels on web - Publishing and exporting files - Trouble shooting sites.

REFERENCE BOOKS

1. The Illusion of Life: Disney Animation by Frank Thomas, Ollie Johnston (Contributor), Collie Johnston.
2. Adobe Flash CS3
3. The Animator's Survival Kit: A Manual of Methods, Principles, and Formulas for Classical, Computer, Games, Stop Motion, and Internet Animators by Richard Williams
SKILL ENHANCEMENT COURSES

Paper Code: CSCA202
ACCOUNTING TOOLS

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OBJECTIVES:
1. To learn about basics entries in Tally
2. To work with Tally Accounting Software for maintaining accounts

MODULE - I

MODULE II

MODULE III
Advanced Accounting in Tally - Billwise details – Cost Centers and Cost Categories – Voucher class and Class Center Class – Multiple Currencies – Bank Reconciliation – Interest Calculations.

TEXT BOOK
1. Tally .ERP 9 in Simple Steps, Kogent Learning Solution
SKILL ENHANCEMENT COURSES

Paper Code: CSCA301
MOBILE APPLICATION DEVELOPMENT

OBJECTIVES:
1. Create a simple application that runs under the Android operating system.
2. Access and work with the Android file system.
3. Create an application that uses multimedia under the Android operating system.
4. Access and work with databases under the Android operating system.

MODULE - I
What is Android, Android Tools, Your First Android Application, Anatomy of Android Application, Workspaces, Editors in Eclipse, Eclipse Perspective, Refactoring - Creating Android Emulator, Creating Snapshot, SD Card Emulation, Sending SMS Messages to the Emulator, Transferring Files into and out of the Emulator, Resetting the Emulator

MODULE - II
Activity, Linking Activity using Intent, Fragments, Calling Build-In Application using Intent, Notifications
Components of a Screen, Display Orientation, Action Bar, listening for User Inter

MODULE - III
Basic Views, Picker Views, List View, Specialized Fragment, Gallery and Image View, Image Switcher, Grid View, Options Menu, Context Menu, Clock View, Web view

REFERENCE BOOKS:
1. Android Programming: The Big Nerd Ranch Guide (Big Nerd Ranch Guides) By: Bill Philips & Brian Hardy
2. Android Design Patterns: Interaction design solutions for developers by Greg Nudelman
3. Android User Interface Design: Turning Ideas and Sketches into Beautifully Designed Apps By: Ian G. Clifton
4. Android Recipes: A Problem-Solution Approach By: Dave Smith & Jeff Friesen
SKILL ENHANCEMENT COURSES

Paper Code: CSCA302  
LINUX AND SHELL PROGRAMMING

OBJECTIVE:

- It aims to introduce about open source operating system as we can use Linux as Server OS or as standalone OS on our PC, Shell scripting & IPC etc.

MODULE - I
UNIX UTILITIES: Introduction to UNIX file system; vi editor; file handling utilities; security by file permissions; process utilities; disk utilities; networking commands; cp; mv; ln; rm; unlink; mkdir; rmdir; du; df; mount; umount; find; ps; who; w; finger; arp; ftp; telnet; rlogin; text processing utilities and backup utilities; detailed commands to be covered are cat; tail; head; sort; nl; uniq; gerep; egrep; fgrep; cut; paste; join; tee; pg; comm.; cmp; diff; tr; awk; tar; cpio.

MODULE - II
PROBLEM SOVING APPROACHES IN UNIX: Using single commands; using compound commands; shell scripts; C programs; building own command library of programs; working with the Bourne shell : what is a shell; shell responsibilities; pipes and input redirection; output redirection; shell script examples.

MODULE – III
UNIX FILES: UNIX file structure; directories; files and devices; system calls; library functions; usage of open; creat; read write; close; lseek; stat; fstat; octl; umask; dup; dup2; the standard I/O ( fopen; fclose; fflush; fseek; fgetc; getc; getchar; fputc; putc; putchar; fgets; gets); formatted I/O; stream errors; streams and file descriptors; file and directory maintenance (chmod; chown; unlink; link; symlink; mkdir; rmdir; chdir; getcwd).

TEXT BOOKS:

REFERENCE BOOKS: