

Kadi Sarva Vishwavidhyalaya, Gandhinagar

BCA Semester II BCA201 – Part 1 – Soft Skills Personality Development & Leadership

Rationale:

Personality development grooms an individual and helps him make a mark of his/her own. Individuals need to have a style of their own for others to follow them. Do not blindly copy others. You need to set an example for people around. Personality development not only makes you look good and presentable but also helps you face the world with a smile. Personality development goes a long way in reducing stress and conflicts. It encourages individuals to look at the brighter sides of life. Face even the worst situations with a smile. Trust me, flashing your trillion dollar smile will not only melt half of your problems but also evaporate your stress and worries. There is no point cribbing over minor issues and problems.

Learning Outcomes

1. Describe how a personality develops
2. Define the stages of personality development
3. Define the inner strength and weaknesses
4. Describe how moral are develops.
5. How to increase vocabulary
6. Identify the quality of leader and managing ego and attitudes
7. Managing conflict and time management and motivational technique.

Teaching and Evaluation Scheme:

Sub. Code	Sub. Type	Subject Title	Teaching Scheme		Exam Scheme				
			Cr.	Hrs. / Week	Theory		Practical		Total Marks
					Internal	External	Internal	External	
BCA 201	Soft Skills	Personality Development & Leadership	2	2	15	35	-	-	50

Courses content:

Unit 1: Introduction to Personality and Techniques in Personality Stage -I (50%)

- Definition and basics of personality
- Analyzing strength and weakness (SWOT)
- Building self-esteem and self-confidence
- Introduction to leadership
- Group Dynamics
- Team Building

No. of Lectures-10

Unit 2: Techniques in Personality Development Stage II and Motivation

(50%)

- Interpersonal Relationships
- Stress Management : Causes, Impact and Managing Stress
- Conflict Management : Introduction to Conflict Management
- Time Management : Concept , Importance and Need, Steps towards better Time Management
- Motivation: Introduction to Motivation and types of motivation

No. of Lectures-10

Books: No Book is recommended – The Material will be either provided by the college or it will be made available in the college Library.

Question Paper Pattern:

University Examination

Duration: 1.5 Hours

Total Marks: 35

Q-1 Unit I & II	(11 Marks)
Objective/Short Questions	
Q-2 Unit I	(12 Marks)
Descriptive/ Long Questions	
Q-3 Unit II	(12 Marks)
Descriptive/ Long Questions	

X-----X

Kadi Sarva Vishwavidhyalaya, Gandhinagar
BCA Semester II
BCA202 – Part 1 – Language: English
Professional Communication

Rationale:

It has been observed that linguistic competence is essential to understand the basic concepts of various subjects. Therefore, this course is designed with an aim to make learners proficient & efficient in the use of English language. A sincere effort is being made to expose the learners to the four basic linguistic skills- Listening, speaking, reading & writing.

The student will be able to –

1. Enhance their communication skills.
2. Motivate them to communicate in English effectively.
3. Acquaint them with vocabulary & sentence formation.
4. Get into group tasks like debates, discussions, presentations etc.
5. Improve their writing & presentation skills.

Teaching and Evaluation Scheme:

Sub. Code	Sub. Type	Subject Title	Teaching Scheme		Exam Scheme				
			Cr.	Hrs. / Week	Theory		Practical		Total Marks
					Internal	External	Internal	External	
BCA 202	Language: English	Professional Communication	2	2	15	35	-	-	50

Courses content:

Unit 1: Business Communication

Business Letter Writing

- Letters – Parts and layout of Business letter
- 5. Inquiry-Reply
- 6. Order-Letter
- 7. Complain letter
- 8. Adjustment letter

(Book 3: Pg no.80-84)

Unit 2 : Impact of Technology in Communication and Soft Skills:

Latest Communication tools:

Email – Etiquettes and composing of E-mail (Book 3: Pg no.131-136)

(Book4: 120, 121, 122,123, 124)

Blog: Types and steps to create Blog (<http://blogbasics.com/what-is-a-blog/>)

Soft Skills:

Group Discussion: Meaning and Characteristics of Group Discussion (Book 1: Pg no.408-421)

Presentation Skills: Tips for effective presentation. 4P's of Presentation (Book 3: Pg no. 41-44)

Interview Skills: Types, Do's and Don'ts of Interview (Book 1: Pg no.357-383)

Reference Books:

- Book 1. Business Communication, Meenakshi Raman & Prakash Singh, 2nd Edition Oxford.
Book 2. Basic Communication Skills for Technology, Andrea Rutherford, Person
Book 3. Rosily Victor, Communication Skills, Synergy Knowledgeware (Mumbai)
Book 4. Herta A Murphy, Herbert W Hildebrandt, Jane P Thomas, The McGraw Hill Publication

Sources Required:

Projector and speakers in class

Activities:

- Group discussion Practice
- Presentation Practice
- Demonstration of Interview
- Manners and etiquette
- How to use and create E-mail and blog

Question Paper Pattern:

University Examination	Duration: 1.5 Hours	Total Marks: 35
Q-1 Unit I & II		(11 Marks)
Objective/Short Questions		
Q-2 Unit I		(12 Marks)
Descriptive/ Long Questions		
Q-3 Unit II		(12 Marks)
Descriptive/ Long Questions		

X ----- X

Kadi Sarva Vishwavidhyalaya, Gandhinagar

BCA Semester II

BCA203 – Part 2: Core 4

Programming With 'C'

Rationale:

To develop the concept of advanced programming using world's most popular Middle Level Language through "C"

Learning Outcomes: The student will be able to ...

- Develop users define function.
- Use a concept of structure and union.
- Develop type of data storing with File Handling
- Know the importance of reference process by pointer.
- Know the concept of Dynamic Memory Allocation.

Teaching Methodology:

- Application and Real life examples
- Theory Method with illustration and presentation
- Models
- Charts
- Practical Implementation Simulators
- Animated Video

Evaluation Scheme:

The objective of evaluation is not only to measure the performance of students, but also to motivate them for better performance. Students are evaluated on the basis of internal examinations which consist of Term Work such as class test, quizzes, class participation, home assignments, presentation, Regular Attendance

Teaching and Evaluation Scheme:

Sub. Code	Sub. Type	Subject Title	Teaching Scheme		Exam Scheme				
			Cr.	Hrs. / Week	Theory		Practical		Total Marks
					Internal	External	Internal	External	
BCA 203	Core	Programming with 'C'	4	4	30	70	-	-	100

Course content:

Unit-I

(25%)

Objective: Understand what a function is and how its use benefits a program. Learn how a function declaration, call, and definition are constructed.

User- Defined Functions:

Introduction, Need for user-defined functions, Elements of UDF (function definition, function call and function declaration), return value and their types Category of functions - No arguments and no return values, Argument with no return values, No argument with return values, Arguments with return values, Nesting of functions, Recursion.

Text Book Reference Page No: 262 to 289

Unit-II

(25%)

Objective: Understand the user defined data type called structure and unions and its members and variables

Structures:

Introduction, Structure definition, declaration and initialization of structure, accessing structure member, Comparison of structures and Arrays, Arrays of structures variable, array within structure ,concept of Structures within Structures, Structures and functions

Union:

Introduction, union definition, declaration and initialization of union, accessing union member, Comparison of structure and union

Text Book Reference Page No: 317 to 335

Unit-III

(25%)

Objective: Learn the concept of memory addresses and pointers

Pointers:

Introduction, concept and application of pointers, Accessing the address of a variable, Declaring and initializing pointers, Accessing a variable through its pointer, Pointer expressions, Pointer increments and scale factor, Pointers and arrays (one dimensional), Pointers and character strings, array of pointer, Pointers and Functions

Text Book Reference Page No: 351 to 373

Unit-IV

(25%)

Objective: Know about the concept of streams used in the C file system. Comprehend how to process different files using standard library function. Understand the concept of dynamic memory allocation and Pre-processors

File Management in C:

Introduction and Application, Defining and opening a file, closing a file, file handling functions, Command line arguments.

Dynamic Memory Allocation:

Introduction, Memory allocation functions (malloc, calloc, free, realloc)

Text Book Reference Page No: 389-405,411-416

Text Book: 1. Programming in ANSI C, Balagurusamy, Tata McGraw-Hill

Reference Books:

1. Programming in C, by Pradip Dey & Manas Ghosh, Publisher–Oxford
2. The Complete Reference, Herbert schildt Fourth Edition
3. Let Us C , Yashwant Kanetkar, BPB Publications
4. Programming in C, by Reenathareja Publisher–Oxford

Reference Link:

www.carrerskill.com

www.mcqsets.com

www.indiabix.com

www.sanfoundry.com

Question Paper Scheme:

University Examination	Duration: 3 Hours.	Total marks: 70
Q.1-Unit-I & II		(11 Marks)
Objective / Short Questions		
Q.2-Unit-I		(12 Marks)
Descriptive / Long questions		
Q.3-Unit-II		(12 Marks)
Descriptive / Long questions		
Q.4-Unit-III & IV		(11 Marks)
Objective / Short Questions		
Q.5-Unit-III		(12 Marks)
Descriptive / Long questions		
Q.6-Unit-IV		(12 Marks)
Descriptive / Long questions		

Note: Q.2,3,5 and Q.6 must have at least 40% Internal Options (i.e. Attempt Any 3 out of 5)

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Kadi Sarva Vishwavidhyalaya, Gandhinagar

BCA Semester II

BCA204 – Part 2: Core 5

Database Management System – I

Rationale:

Database Management System – I enables beginners to understand the basic concepts of database and various other activities that can be carried out in a database environment. This subject will allow students to develop understanding of the basic concepts of data in general and relational Database System in particular. The students will learn Database concept, Data Models, various approaches to Database Design, strength of Relational Model

Learning Outcomes

- To understand the concept of Database
- To recognize the elements of Database for real applications
- To identify the key relationship between Database components
- To deal with every tiny elements of the Database

Resource Required

- Lab Facility with Microsoft Office Software
- Projector

Teaching and Evaluation Scheme:

Sub. Code	Sub. Type	Subject Title	Teaching Scheme		Exam Scheme				Total Marks
			Cr.	Hrs. / Week	Theory		Practical		
					Internal	External	Internal	External	
BCA 204	Core	Database Management System -I	4	4	30	70	-	-	100

Course content:

Unit-I

(25%)

Introduction to File Systems and Database Systems

Applications: The Database is evolved from computer file systems. Here we will learn serious Data Management limitations and eliminating the shortcomings of file system by Database Management.

Data and Information

- Files and File System ,
- Problems with File System, 3GL and 4GL, Limitations of File System, Structural and Data Dependence, Field Definition and naming Conventions , Data Redundancy, Data Inconsistency, Data Anomaly
- Introduction of the Database
- Types of Databases
 - ✓ SingleUser, Desktop, MultiUser, Workgroup, Enterprise, Centralized, Distributed, Operational
- Introduction of DBMS

- Interaction between End User and Database(Role of DBMS)
- Advantages of DBMS
- Database System Environment(Components)
- DBMS Functions

Book: Database Systems Design, Implementation and Management by Peter Rob & Carlos Coronel, Pg No: 5 -20

Unit-II (25%)

Data and ER Models

Applications: Data Modeling is the first step in the Database design journey, serving as a bridge between real world objects and the Database that recites in the computer

- Building Blocks of Data Models
 - ✓ Entity, Attribute, Relationship and Types ,Constraints
- Types of Data Model
 - ✓ Hierarchical, Network , Relational, Object- Oriented
 - ✓ E-R Model----- Pg No:109 -115
 - Types (Chen's , Crow's Foot)
 - Symbols and Relationship
 - Connectivity and Cardinality, Relationship Strength (Strong, Weak)
 - Weak Entity
 - Generalization and specialization

Book: Database Systems Design, Implementation and Management by Peter Rob & Carlos Coronel, Pg No: 30- 44, Pg No:109 -115

Unit-III (25%)

Relational Database Model

Applications: In this chapter the students will learn the Relational Model's Logical Structure and more about how the ER Diagrams can be used to design a relational Database.

- DBMS Vs. RDBMS
- Tables and Characteristics
- Functional Dependency
- Keys - Super Key , Candidate Key , Primary Key , Foreign Key , Secondary Key, Composite Key
- Integrity Rules - Entity Integrity , Referential Integrity
- Relational Set Operators - Union, Intersect, Difference, Divide, Product, Select, Project, Join (Natural, Equi, Theta, Left Outer, Right Outer)

Book: Database Systems Design, Implementation and Management by Peter Rob & Carlos Coronel, Pg No: 61-76

Unit-IV (25%)

Advanced Data Modelling Applications: This unit will depict to summarize the data required to implement a successful database Design

- Attribute, Types and Symbols ----- Pg No:105-108
 - Simple Attribute, Composite Attribute, Single Valued, Multi Valued , Derived
- Degrees of Abstraction----- Pg No: 46- 50
 - External, Conceptual, Internal, Physical
- Relationship Degree----- Pg No: 118-120
 - Unary, Binary, Ternary
- ER Diagram of Library Management System
- ER Diagram of University Management System

Text Book

1. Database Systems Design, Implementation, and Management. 7th Edition and Further
Author: Peter Rob, Carlos Coronel And Publication: Cengage Learning

Reference Book

1. Introduction to Database Management System, Publication: Tata McGraw- Hill , Author :
ISRD Group
2. An Introduction to Database Systems, Publication: Pearson Author : C. J. Date, A. Kannan &
S. Swamynathan

Question Paper Scheme:

University Examination	Duration: 3 Hours.	Total marks: 70
Q.1-Unit-I & II		(11 Marks)
Objective / Short Questions		
Q.2-Unit-I		(12 Marks)
Descriptive / Long questions		
Q.3-Unit-II		(12 Marks)
Descriptive / Long questions		
Q.4-Unit-III & IV		(11 Marks)
Objective / Short Questions		
Q.5-Unit-III		(12 Marks)
Descriptive / Long questions		
Q.6-Unit-IV		(12 Marks)
Descriptive / Long questions		

Note: Q.2,3,5 and Q.6 must have at least 40% Internal Options (i.e. Attempt Any 3 out of 5)

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Kadi Sarva Vishwavidhyalaya, Gandhinagar
BCA Semester II
BCA205 – Part 2: Core 6
System Analysis and Design

Rationale:

Large number of jobs today for computer science graduates is in creating information systems for managing organizations. Systems Analysis is a central part of systems development. It comprises the process of turning a set of user requirements into a logical system specification and encompasses various activities to achieve this end. The traditional systems lifecycle has been challenged by alternative models, for example the spiral (iterative and incremental) lifecycle and rapid application development. There are a variety of systems development approaches including the structured approach, the object oriented approach. Systems Analysis activities will be studied in the context of these trends. Candidates should be familiar with at least one structured approach (e.g. SSADM) and one object oriented approach (e.g. the Unified Process).

Learning Outcomes: Students will be able to:

- To understand the role of systems analysis within various systems development life cycles.
- To develop an awareness of the different approaches that may be taken to systems analysis.
- To understand the systems analyst's activities, and apply current tools and techniques.
- Describe different life cycle models and explain the contribution of systems analysis within them.
- Discuss various systems analysis approaches and explain their strengths and weaknesses.
- Evaluate the tools and techniques that may be used by a systems analyst in a given context.
- Use appropriate methods and techniques to produce a systems analysis for a given scenario.
- Provide suitable systems documentation for an analysis.
- Will be able to implement SDLC by small case studies.

Resource Utilization:

Lecture based on Activity Oriented Classroom Teaching by availing case studies, Projector.

Teaching and Evaluation Scheme:

Sub. Code	Sub. Type	Subject Title	Teaching Scheme		Exam Scheme				
			Cr.	Hrs. / Week	Theory		Practical		Total Marks
					Internal	External	Internal	External	
BCA 205	Core	System Analysis and Design	4	4	30	70	-	-	100

Course Content:

Unit I

(25%)

Objective

Learners will know: Information System concept, System Analyst Role, Business Information System model, Organizational structure levels and the team of Information technology Department.

Content

System Analysis and Design: concept and need; Information System: System, Information System Components; System Analyst: Role, Skills, Tools used by System Analyst; Business Information System: Business Profile, Business Case, Business Process Modeling, E- Commerce Business Types (B2C, B2B), Business Information System categories; Organization: Hierarchy, Level based Structure; Information Technology Department.

Text Book Reference Page No: 22-34, 45-48

Unit 2:

(25%)

Objective

Learners will be acquainted with: System Development Methods categories, Software Development Life Cycle Stages, detailing of System Planning System Analysis Stages.

Content

System Development Method: Structured Analysis - Software Development Life Cycle Stages and Object Oriented Analysis concept.

System Planning: Strategic Planning – SWOT Analysis; System Projects: Main reasons for System Request, Internal & External Factors; Feasibility Study types: Operational, Technical, Economical

(Tangible and Intangible Benefit), Schedule Feasibility; Preliminary Investigation Steps.

System Analysis : System Analysis Stages, Joint Application Development and Rapid Application Development Concept, Fact Finding Techniques : Interview Steps, Document Review, Observation, Questionnaires and Surveys, Sampling, Research ; Data Flow Diagrams : Symbols, Guidelines for Drawing DFD, Creating DFD (Context Level & First Level Diagram); Data Dictionary elements ; Process Description Tools : Modular Design, Structured English, Decision Tables, Decision Trees; Prototyping Methods : System Prototyping and Design Prototyping.

Text Book Reference Page No: 36-40, 60-61, 66-71, 74-77, 78-86,101-106,113-127,
150-162, 255-256

Unit 3:

(25%)

Objective

Learners will be familiar with: System Design Stage, User Interface Design Types, Input and Output Design Concepts.

Content

System Design : User Interface Design : types- Process Centered Information System Model and User Centered Information System Model, Guidelines for User Interface Design ; Input Design : Types of Input Devices, Input Methods – Batch Input and Online Input ; Output Design : Types of Output, Reports – Summary Report, Exception Report and Detailed Report ; Data Design basic Terminology : Entity, Table or File, Field, Record.

Text Book Reference Page No: 281-282, 281-282, 296-297, 268-274, 327-328

Unit 4:

(25%)

Objective

Learners will be gaining knowledge of: System Design Implementation Stage Concept – Coding, Software Quality Assurance, Software Testing Types, Documentation, Management Approval and Systems Operations, Support and Security Stage to maximize return on the Investment as well as Security Control safeguard the system from both external and internal threats.

Content

System Implementation: Coding Concept; Software Quality Assurance concept; Types of Software testing – Unit Testing, Integration Testing and System Testing; Documentation Concept and Types, Management Approval.

Systems Operations, Support and Security: Training – training Plan, Types of Training; Data Conversion concept; System Changeover Types: Direct Cutover, Parallel Operations, Pilot Operations, Staged Operation; Post Implementation task; Final Report to Management.

Text Book Reference Page No: 430-431, 416-417, 431-435, 435-455

Text Books:

[1] System Analysis and Design Methods; 4th edition; by Shelly, Cashman, Rosenblatt; Cengage Learning India Edition.

Reference:

[2] System Analysis and Design, 3rd edition, by Elias Awad (Galgotia Publications).

Question Paper Scheme:

University Examination	Duration: 3.00 Hours.	Total marks: 70
Q.1-Unit-I & II	Objective / Short Questions	(11 Marks)
Q.2-Unit-I	Descriptive / Long questions	(12 Marks)
Q.3-Unit-II	Descriptive / Long questions	(12 Marks)
Q.4-Unit-III & IV	Objective / Short Questions	(11 Marks)
Q.5-Unit-III	Descriptive / Long questions	(12 Marks)
Q.6-Unit-IV	Descriptive / Long questions	(12 Marks)

Kadi Sarva Vishwavidhyalaya, Gandhinagar
BCA Semester II
BCA206 – Part 2: Core 4 (Practical)
Programming with ‘C’

Teaching and Evaluation Scheme:

Sub. Code	Sub. Type	Subject Title	Teaching Scheme		Exam Scheme				
			Cr.	Hrs. / Week	Theory		Practical		Total Marks
					Internal	External	Internal	External	
BCA 206	Core	Programming with ‘C’	2	4	-	-	15	35	50

Unit -1: Understand the concept of user defined function:

- Write a program to check the no. is Palindrome or not using UDF.
- Write a program to find sum of digits of given no using UDF.
- Write a program to find first 5 prime no using UDF.
- Write a program to swap value of two integer number using UDF
- Write a program that will print the longest word written in a line using UDF.
- Write a C program to convert all Lowercase character into their uppercase character using UDF.
- Write a program that uses a UDF to sort an array of integer.
- Write a program to search a number within an array using UDF.
- Write a program to find factorial of given no using recursion.
- Write a program to display first 25 terms of Fibonacci series using recursion.
- Write a program which explains the use of nesting of functions.

Unit -2: Understand the concept of Structure and Union:

- Define a structure of person that would contain person name, date of joining and salary using this structure to read this information of 5 people and print the same on screen.
- Define a structure of student that would contain student name, branch and total marks obtained.
- Define a structure of cricket that will describe the following information: Player name, Team name, runs, declare an array player with 10 elements and write a program to read the information about all 10 players and print.
- In a program declare following structure member: name, code, age, weight and height. Read all members of the structure for 10 persons and find list of persons with all related data whose weight > 50 and height > 40 and print the same with suitable format and title.

Unit -3: Understand the concept of Pointer:

- Write a program to print the value and address of the element using pointer.
- Write a program to accept 10 numbers and display its sum using pointer.
- Write a program to accept 10 numbers and sort them with use of pointer.
- Write a program to swap the two values using pointers and UDF.
- Write a program using pointer to determine the length of a character string.
- Write a program using pointers to read an array of integers and print its elements in reverse order.
- Write a program using UDF and pointers to add two matrices and to return the resultant matrix to the calling function.

Unit -4: Understand the concept of File Management:

- Create one text file store some information into it and print the same information on Terminal.
- A file named data contains series of integer no. Write a c program to read that no. and then Write all odd no into file named odd no and write all even no into file named even no
- Display all the contents of these file on screen.
- Write a c program to read data from keyboard write it to a file called input and Display data of input file on the screen.
- Write a program that counts the number of characters and number of lines in a file.
- Two files DATA1 and DATA2 contain sorted lists of integers. Write a program to produce a third file DATA which holds a single sorted, merged list of these two lists. Use command line arguments to specify the file names.
- Write a program to work as a dos copy command using command line argument.
- Write a C program to work as a dos type command using command line argument.
- Write a C program to work as a dos copy command using command line argument.

Evaluation Scheme:

Practical	Viva	Journal	Total
21	7	7	35

X-----X

Kadi Sarva Vishwavidhyalaya, Gandhinagar
BCA Semester II
BCA207 – Part 2: Core 5 (Practical)
Database Management System – I

Rationale

The course is intended to make students familiar with the features of Database Tools .It focuses on both basic and advanced features.

Learning outcome

- To Gain the knowledge of various DBMS software Tools
- To develop skills for effective use of DBMS Software
- To Understand how to use the Database in Day-to-Day Life

Resource Required

- Lab Facility with Microsoft Office Software
- Projector

Teaching Scheme & Exam Scheme:

Sub. Code	Sub. Type	Subject Title	Teaching Scheme		Exam Scheme				
			Cr.	Hrs. / Week	Theory		Practical		Total Marks
					Internal	External	Internal	External	
BCA 207	Core	Database Management System -I	2	4	-	-	15	35	50

Unit 1: Database, Tables and Queries

Applications: Database and tables will manage the data in a structured way, and queries will allow you to retrieve required information from the pool of data.

- Creating a New Database
 - Creating a Table(Using wizard , Using Design view)
 - Data Types, Applying Primary Key, Entering Data , Field Properties
 - Giving Relationship ,Sorting and Searching , Filters
 - Concept of Foreign Key(Parent Table, Child Table)
- Queries
 - Simple Queries on Single Table
 - Simple Queries on Multiple Tables
 - Action Queries

Unit 2: Forms, Reports and across

Applications: Forms will allow you to collect information in the proper format. Reports provide information in a useful way. And Macro allows you to automate tasks and add functionality to the form

- Simple Forms(Using Wizard, Using Design View)
- Sections on a Form
- Controls on a Form(Label, Text Box, Combo Box, List Box, Command Button, Option Group, Tab Control, Option Button, Check Box, Toggle Button)
- Creating Sub Form
- Simple Reports(Using Wizard, Using Design View)
- Group Reports , Simple Macro

Note: Practical's and Examination can be conducted using any DBMS software.

Evaluation Scheme:

Practical	Viva	Journal	Total
21	7	7	35

X-----X

Kadi Sarva Vishwavidhyalaya, Gandhinagar
BCA Semester II
BCA208 – Part 3: Foundation Course
Computer Oriented Numerical Techniques

Rationale:

Computer Oriented Numerical methods provides the understanding of various concepts of numerical methods like Numerical errors in calculations, Interpolation, Numerical Integration, Numerical solution of Ordinary Differential Equations.

Prerequisites:

1. Fundamental knowledge of Numerical Computations
2. Basic information of storage in computer system
3. Idea of equal-spaced values

Learning Outcomes:

Concept cause & consequence of errors in the application of numerical computing
 Numerical techniques for solving various problems
 Applications of mathematics in real life domain

Teaching and Evaluation Scheme:

Sub. Code	Sub. Type	Subject Title	Teaching Scheme		Exam Scheme				
			Cr.	Hrs. / Week	Theory		Practical		Total Marks
					Internal	External	Internal	External	
BCA 208	Foundation Course	Computer Oriented Numerical Techniques	2	2	15	35	-	-	50

Course content:

Unit 1:

(50%)

Objective: To facilitate deep understanding of accuracy, precision and different numerical errors. To help learners to enhance their knowledge in the field of interpolation; To find out values of unknown information from given set of known information.

Numerical Errors and Interpolation

Numerical Error, Different types of errors in numerical computation (Absolute, Relative, Truncation, Round Off, Percentage), Floating point numbers, Normalized Floating Point (addition, subtraction, multiplication, division, underflow, overflow)

Interpolation, Extrapolation, Forward Differences, Backward Differences, Newton's Forward and Backward Difference Interpolation Formulas, Lagrange Interpolation and Inverse Interpolation Formula (Examples Only).

Coverage of topics in Books:

Scientific and Statistical Computing Page no. 1-42, 108-113,126-137,164-167,184-187,
 Computer Oriented Numerical Methods (R.S.) Page no.36-53[50], 221-244[228-229,232-235]

Application: Main application is to obtain numerical solution of real life problems with considerable ease and to obtain approximate solution as close to the exact solution as possible. To enhance knowledge of storage of real numbers in computer system; Interpolation is widely used in functionality of Zoom in and Zoom out. To optimize quality of digital image

Unit-2:

(50%)

Objective: To study basic concepts of integration and differentiation. To integrate part of function or given tabulated values. To enhance concept of ordinary differential equations. To study the behavior of the approximation error as a function of the number of integrand evaluations **Numerical Integration and Solution of Ordinary Differential Equations**

Numerical Integration, Trapezoidal Rule, Simpson's (1/3) rule, Simpson's (3/8) rule, Weddle's Rule (Examples Only)

Concept of Numerical Differentiation and Ordinary Differential Equations (ODE), Euler's method, Modified Euler's method, RK 2nd order method, RK 4th order method (Examples Only)

Coverage of topics in Books:

Numerical Methods 9.17-9.20,9.24-9.27, 11.22-11.32[11.24],11.35-11.41

Computer Oriented Numerical Methods (R.S.) 301-307,310-313,317-319,332-333,
350-354,356-361,367-370

Applications: To find the area under the curve of a function. Integration can be used to find areas, volumes, central points and to parameterize a curve. To develop a large-scale integration (LSI) enabled hardware. To simulate information systems such as computer controlled systems, communication systems, and control systems.

Climate modeling, Big bang theory modeling, Prediction of building failures all the natural phenomenon (heat equations, fluid flow equations, hooks law etc) can be modeled using differential equations. ODE is used in signal processing and different signal transforms; also used to find maxima and minima of quantity and to build application which shows temperature. The heating and cooling problem of computer is modeled using the differential equation and solved by computer itself. Also used in Simulation based applications.

Text Book:

1. Scientific and Statistical Computing: Auther(s): Ketan Gajjar, Parag Shah Publication: Nirav Prakashan
2. Computer Oriented Numerical Methods: Auther(s): R. S. Salaria ,Publication: Khanna Book Publishing Co. Ltd.
3. Numerical Methods: Auther(s): Dr. V. N. Vedmurthy, Dr. Ch. S. N. Iyenger, Publication: Vikas Publishing House Pvt. Ltd.

Reference Books:

1. Introductory methods of Numerical Analysis [5th Ed.]: Auther(s): S.S. Sasrty, Publication: PHI Learning Pvt. Ltd.
2. Mathematics for Computer Students: Auther(s): Rex Wilton, Publication: BPB Publication,
3. Computer Oriented Numerical Methods: Auther(s): V. Rajaraman, Publication: Prentice Hall of India

Question Paper Pattern:

University Examination	Duration: 1.5 Hours	Total Marks: 35
Q-1 Unit I & II (n Out of n [All Compulsory]) Objective/Short Questions		(11 Marks)
Q-2 Unit I (m Out of n) Descriptive/ Long Questions		(12 Marks)
Q-3 Unit II (m Out of n) Descriptive/ Long Questions		(12 Marks)
X -----X		