College of Computer, Science & Information Technology - Junagadh

AFFILIATED TO BHAKTA KAVI NARSINH MEHTA UNIVERSITY

C C S I T

✦ **Syllabus (as per NEP-2020)** ✦

B.Sc.(IT) [Bachelor of Science in Information Technology]
B.C.A. [Bachelor of Computer Application]
[Semester – III & IV]

Academic Year : 2024–25

(Effective from June – 2024)

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Credit Structure for Semester – 3

Sr. No.	Course Group (Major/Minor/MDC/ SEC/AEC/VAC)	Course Paper Title	Credit	Ext. Marks (Theory)	Int. Marks (Theory)	Ext. Marks (Pract.)	Int. Marks (Pract.)	Total Marks
1	Major-5	OOP Concepts using C++ (Theory)	04	50	50	--	--	100
2	Major-6	OOP Concepts using C++ (Practical)	04	--	--	50	50	100
3	Major-7	DBMS - 1	04	50	50	--	--	100
4	MDC-3	Mathematics	04	50	50	--	--	100
5	SEC-3	CMS with WordPress	02	25	25	--	--	50
6	AEC-3	English Language & Grammar – 1	02	25	25	--	--	50
7	VAC-3	IKS-2 : Indian Mythology – Avatars	02	25	25	--	--	50
	Total Credits		22	Total Marks				550

Credit Structure for Semester – 4

Sr. No.	Course Group (Major/Minor/MDC/ SEC/AEC/VAC)	Course Paper Title	Credit	Ext. Marks (Theory)	Int. Marks (Theory)	Ext. Marks (Pract.)	Int. Marks (Pract.)	Total Marks
1	Major-8	Programming in JAVA(Theory)	04	50	50	--	--	100
2	Major-9	Programming in JAVA(Practical)	04	--	--	50	50	100
3	Major-10	DBMS – II	04	50	50	--	--	100
4	Minor – 3	Programming with C#.NET	04	50	50	--	--	100
5	SEC-4	Operating System	02	25	25	--	--	50
6	AEC-4	English Language & Grammar – 2	02	25	25	--	--	50
7	VAC-4	Agri. Engineering (Envi. Science-2)	02	25	25	--	--	50
	Total Credits		22	Total Marks				550

General Instructions (Passing Standard) :

The standard of passing the B.Sc.(IT)/B.C.A. Degree Examination will be as under:
1. To pass any semester examination of the B.Sc.(IT)/B.C.A. Degree, a candidate must obtain at least 36% marks in the university examination (External & Internal) with all sections (e.g. Theory, Practical & Internal) separately in each course.
2. Class will be awarded based on Earned Grade Points, SGPA and CGPA as per rules of University.

B.Sc.(IT) & B.C.A. SEMESTER – III

MAJOR-05 : OOP Concepts using C++ (THEORY)

Unit-1 :   **[Teaching Hrs. 15]**

Procedure – Oriented Programming v/s Object Oriented Programming

    Basic concepts and benefits of object-oriented Programming

    What is c++?

    Structure of c++ program

Tokens :   Keywords, identifiers, basic data types, user defined types, derived data types, declaration of variables, dynamic initialization of variables, reference variables

Operators in C++ :   Input/output operators, Scope resolution operator, member referencing operator, memory management operator, manipulators, and type cast operator.

Expression :
- Expression and their types, special assignment operator, implicit conversions

Control structures
- Conditional control structure:
- Simple if, if...else, nested if else, switch etc.
- Looping control structure :
- for, while, do...while

Functions in C++

- The main function
- Function prototype
- Call by reference
- Return by reference
- Inline function
- Default arguments
- Functions overloading

Unit-2 :   [Teaching Hrs. 15]

- **Concept of class:**
  - Definition and specification
  - Local Classes, Nested Classes
- **Declaring member variables and member functions**
  - Access Specifiers: public, private, protected
  - Static data member
  - Array within a class
  - nesting of Member functions
  - Friend functions
  - making outside function inline
- **Objects:**
  - Concept of object
  - Memory allocation for objects
  - Arrays of objects
  - Objects as function arguments
  - Returning objects from functions
- **Constructors:**
  - Concept and features of constructor
  - Multiple constructors in a class
  - Parameterized constructor
  - Constructor with default argument
  - Copy constructor
  - Dynamic constructor
  - Explicit constructor
  - Dynamic initialization of objects
- **Destructors**
  - Concept, definition and call mechanism

Unit-3 :   [Teaching Hrs. 15]

- **Operator overloading:**
  - Definition and concept
  - Rules for operator overloading
  - Over loading unary and binary operators
  - Overloading of operators using friend Function
  - Manipulation of string using operators
  - Type conversions.
  - Comparison of different method of conversion
- **Inheritance:**
  - Definition and concept
  - Types of inheritance (Single, Multiple, Multi-level, Hierarchical, Hybrid)
  - Defining derived classes
  - Constructors in derived class
  - Virtual base class
  - Concept and implementation of virtual functions
  - Containership, Inheritance V/s Containership

Unit-4 :   [Teaching Hrs. 15]

- **Pointers in OOP:**
  - Pointer as member variable
  - Pointer to Object
  - Pointer to derived class
  - this pointer

- **File handling:**
  - Introduction and applications
  - File operations: open, read, write, seek and close
- **Exception handling:**
  - Concept and need
  - Implementation using try, catch and throw

Suggested Reading:

Reference Books: No.	Name	Author / Publication
1	Mastering C++	Venugopal
2	Object Oriented programming in C++	Robert Lafore, Pearson Education
3	Object Oriented Programming in C++	E. Balagurusamy, BPB

Web site References:
- https://www.tutorialspoint.com/cplusplus/
- https://www.javatpoint.com/cpp-tutorial

MAJOR-06 : C++ and Object Oriented Programming (PRACTICAL)

Unit-1 :   **[Teaching Hrs. 30]**

Procedure – Oriented Programming v/s Object Oriented Programming

Basic concepts and benefits of object-oriented Programming

What is c++?

Structure of c++ program

Tokens : Keywords, identifiers, basic data types, user defined types, derived data types, declaration of variables, dynamic initialization of variables, reference variables

Operators in C++ : Input/output operators, Scope resolution operator, member referencing operator, memory management operator, manipulators, and type cast operator.

Expression :
- Expression and their types, special assignment operator, implicit conversions

Control structures
- Conditional control structure:
- Simple if, if…else, nested if else, switch etc.
- Looping control structure :
- for, while, do…while

Functions in C++
- The main function
- Function prototype
- Call by reference
- Return by reference
- Inline function
- Default arguments
- Functions overloading

Unit-2 :   **[Teaching Hrs. 30]**
- **Concept of class:**
  - Definition and specification
  - Local Classes, Nested Classes
- **Declaring member variables and member functions**
  - Access Specifiers: public, private, protected
  - Static data member
  - Array within a class
  - nesting of Member functions
  - Friend functions
  - making outside function inline
- **Objects:**
  - Concept of object
  - Memory allocation for objects
  - Arrays of objects
  - Objects as function arguments
  - Returning objects from functions

- **Constructors:**
  - Concept and features of constructor
  - Multiple constructors in a class
  - Parameterized constructor
  - Constructor with default argument
  - Copy constructor
  - Dynamic constructor
  - Explicit constructor
  - Dynamic initialization of objects
- **Destructors**
  - Concept, definition and call mechanism

Unit-3 :   [Teaching Hrs. 30]
- **Operator overloading:**
  - Definition and concept
  - Rules for operator overloading
  - Over loading unary and binary operators
  - Overloading of operators using friend Function
  - Manipulation of string using operators
  - Type conversions.
  - Comparison of different method of conversion
- **Inheritance:**
  - Definition and concept
  - Types of inheritance (Single, Multiple, Multi-level, Hierarchical, Hybrid)
  - Defining derived classes
  - Constructors in derived class
  - Virtual base class
  - Concept and implementation of virtual functions
  - Containership, Inheritance V/s Containership

Unit-4 :   [Teaching Hrs. 30]
- **Pointers in OOP:**
  - Pointer as member variable
  - Pointer to Object
  - Pointer to derived class
  - this pointer
- **File handling:**
  - Introduction and applications
  - File operations: open, read, write, seek and close
- **Exception handling:**
  - Concept and need
  - Implementation using try, catch and throw

Suggested Reading:

Reference Books: No.	Name	Author / Publication
1	Mastering C++	Venugopal
2	Object Oriented programming in C++	Robert Lafore, Pearson Education
3	Object Oriented Programming in C++	E. Balagurusamy, BPB

Web site References:
- https://www.tutorialspoint.com/cplusplus/
- https://www.javatpoint.com/cpp-tutorial

Major–07 : DBMS-1

Unit-1 :   [Teaching Hrs. 10]
- **Database:**
  - Introduction and types
  - Basic terminology (Data (structured and unstructured), Information, field, record, file)
  - Three levels of Architecture (external, conceptual and internal)
  - Database Schema
- **DBMS:**
  - Introduction, Components, advantages, disadvantages, applications
  - Structure of DBMS
  - Architecture of DBMS

- **RDBMS:**
  - Introduction and applications
  - Basic terminology (relation, tuple, attribute, domain)
  - E. F. Codd Rules
  - Difference between DBMS and RDBMS
- **Data Models:**
  - Introduction
  - Types (Hierarchical, Network and Relational, Entity Relationship, Object based)

Unit-2 : [Teaching Hrs. 10]

- **Normalization:**
  - Concept, need/Advantages and disadvantages
  - Types of Normal forms (1NF, 2NF, 3NF, BCNF)
- **Relational Model:**
  - Concept, advantages, disadvantages
  - Relationship and its types
  - Various Data constraints
  - Concept of keys and its types (Super Key, Candidate key, primary key, alternate key, foreign key)
- **Relational Algebra:**
  - Concept and uses
  - Fundamental Operators (selection, projection, intersection, union, minus)

Unit-3 : [Teaching Hrs. 10]

- **SQL:**
  - Introduction and applications
  - Datatypes, operators and expressions
  - Concept of CRUD operations
  - Query and subquery (definition, concept and example)
- **SQL Commands:**
- Concept and uses
- Various categories of SQL Commands
  - DDL (Data Definition Language)
    - Concept and uses
    - DDL commands (create, drop, alter, truncate)
  - DML (Data Manipulation Language)
    - Concept and uses
    - DML commands (insert, update, delete)
  - DQL (Data Query Language)
    - Concept and uses
    - DQL command (select)
  - DCL (Data Control Language)
    - Concept and uses
    - Creating user
    - DCL commands (grant, revoke)
  - TCL (Transaction Control Language)
    - Concept and uses
    - TCL commands ((commit, rollback, savepoint)
- SQL *PLUS:
  - Concept
  - Working with SQL *PLUS

Unit-4 : [Teaching Hrs. 15]

- **SQL Operators:**
  - Logical (and, or, in, like, between, exists)
  - Set (union, union all, intersect, minus)
- **SQL join:**
  - Concept and uses
  - Types of join (inner, outer, self)
- **SQL Role:**
  - Concept and uses
  - Commands (create role, alter role, drop role, grant, revoke)
- **SQL Functions:**
  - Numeric Function (abs, ceil, exp, floor, greatest, max, min, round, sqrt)

- Character Function (chr, concat, initcap, lower, upper, ltrim, rtrim, trim, replace, substr)
- Date Function (add_months, last_day, months_between, next_day, round (date), sysdate, systimestamp, trunc (date), to_date, to_char
- Aggregate function (Sum, Count, Avg, Max, Min)

Practical : **[Teaching Hrs. 30]**

Suggested Reading:

Reference Books: No.	Name	Author / Publication
1	Oracle Database the Complete Reference	Bob Bryla, Kevin Loney – Oracle Press
2	Oracle Database SQL	Jason Price – Oracle Press

Web site References:
- https://www.geeksforgeeks.org/sql-tutorial/
- https://www.javatpoint.com/sql-tutorial
- https://www.tutorialspoint.com/sql/index.html

MDC-3 : Mathematics

Unit-1 : **[Teaching Hrs. 15]**
- **Set Theory:**
  - Introduction and types
  - Representation of set
  - Properties
  - De 'Morgan laws with proof
  - Operations (Union, intersection, Difference, Complement, Cartesian products (up to two sets))
  - Typical examples
- **Co-ordinate Geometry:**
  - Introduction
  - Quadrants & Axes
  - Distance between two points in R2(without proof)
  - Section formula (without proof)
  - Area of triangle (without proof)
  - Typical examples

Unit-2 : **[Teaching Hrs. 15]**
- **Matrices:**
  - Introduction
  - Different types of matrix (square matrix, column matrix, row matrix, Diagonal matrix. Unit matrix, null matrix)
  - Transpose of matrix
  - Addition, subtraction & multiplication of two matrices
  - Adjoint of a square matrix
  - determinant of matrices up to order 3
  - Inverse of matrix

Unit-3 : **[Teaching Hrs. 15]**
- **Data Analysis:**
  - Frequency Distribution:
    - Definition and concept
    - Graphs (Histogram, Bar Graph and Pie Chart)
    - Table (ungrouped, grouped)
  - Measures of Central Tendency:
    - Definition and concept
    - Median (ungroup data, group data)
    - Mode (ungroup data, group data)
    - Range
  - Measure of dispersion:
    - Definition and concept
    - Mean deviation
    - Standard deviation
    - Quartile Deviation

Unit-4 :   [Teaching Hrs. 15]

- **Probability:**
    - o Definition, concept and applications
    - o Terms (Sample Space, experiment, event, outcome)
    - o Probability of an event and its types
    - o Different Probability Formulas with example

Suggested Reading:

Reference Books: No.	Name	Author / Publication
1	Business Mathematics	Sancheti & Kapoor by Sultan & Chand
2	Statistical Method	Gupta by Sultan & Chand

Web site References:

- https://www.geeksforgeeks.org/maths/
- https://www.tutorialspoint.com/statistics/index.htm

SEC-3 : CMS with WordPress

Unit-1 :   [Teaching Hrs. 05]

- **Content Management System:**
    - o Introduction, Features, Advantages, Disadvantages, Applications
    - o Basics of Blogging
- **WordPress:**
    - o Introduction, Features, Advantages, Disadvantages
    - o Installation of WordPress.
    - o WordPress Directory & file structure.
    - o Dashboard overview
    - o working with page, category, post, tags, and media
    - o User Roles and Responsibilities
    - o Modifying Settings (General, Reading, Writing, Discussion, Media, Permalinks)
    - o Database Structure

Unit-2 :   [Teaching Hrs. 10]

- **Theme:**
    - o Introduction, installation and activation
    - o Common WordPress themes and Template files
- **Widget:**
    - o Introduction
    - o Widget Areas and Widget Management
    - o Available Widgets (Archive, Calendar, Categories, Custom Menu, Meta, Pages, Recent Comments, Recent Posts, RSS, Search, Tag Cloud, Text)
- **Plugins:**
    - o Introduction, installation and activation
    - o Useful Plugins (SEO Yoast, Google Analytics, WooCommerce, Page Builder)

Unit-3 : Practical   [Teaching Hrs. 10]

Suggested Reading:

1. Teach Yourself VISUALLY Word Press, 3rd Edition, George Plumley
2. Build Your Own WordPress Website: An Ultimate Guide for Small Business Owners, Paperback by WordPress Genie

Website References:

1. https://www.tutorialspoint.com/wordpress/
2. https://www.wpbeginner.com/category/wp-tutorials/
3. https://www.siteground.com/tutorials/wordpress/
4. https://learn.wordpress.com/

B.Sc.(IT) & B.C.A. SEMESTER – IV

MAJOR-08 : Programming in JAVA(Theory)

Unit-1 : **[Teaching Hrs. 15]**
- **Overview:**
    - History and Features of Java
    - JDK, JVM and JRE
    - JDK Tools
    - JIT compiler
    - Java IDE (NetBeans and Eclipse)
    - Byte code and machine code
- **Basic building blocks:**
    - Data Type (Integer, Float, Character, Boolean)
    - Java Tokens (Keyword, Literal, Identifier, Whitespace, Separators, Comments)
    - Operators (Arithmetic, Relational, Boolean Logical, Bitwise Logical, Assignment, Unary, Shift, Special operators)
- **Basics of Java programming:**
    - Writing, Compiling and Executing basic Java Program
    - Java variable and scope of variables
    - Decision Statements (if, switch)
    - Looping Statements (for, while, Do-While)
    - Jumping Statements (break, continue, return)
    - Array (One Dim., Rectangular, Jagged)
    - Command Line Argument
- **OOP Concepts:**
    - Definition and concepts of Class, Object, Encapsulation, Inheritance, Polymorphism
    - Creating and using Class with members
    - Static and Non-Static Members
    - Constructor
    - finalize () method
    - Constructor overloading and Method overloading

Unit-2 : **[Teaching Hrs. 15]**
- **Inheritance:**
    - Definition, concept and types
    - Universal Class (Object Class)
    - Access Specifies (public, private, protected, default, private protected)
    - Constructors in inheritance
    - Method Overriding
- **Interface:**
    - Definition and concept
    - Defining Multiple Interface in a single program
    - Execution of interface in simple application
    - implementing Hybrid Inheritance program using Interface
- Nested and Inner Class
- Abstract and Final Class
- Normal import and Static Import
- **Java API packages and important classes:**
    - Introduction to API packages
    - Various packages (java.lang, java.util, java.io, java.net, java.awt, java.awt.event, java.applet, java.swing)
    - java.lang Package Classes (Math, Wrapper Classes, String, String Buffer, Number, Package)
    - java.util Package Classes (Random, Date, GregorianCalendar, Vector, HashTable, StringTokenizer, SimpleTimeZone, Stack, Scanner)
    - Creating and Using User Defined package and sub-package
- **Exception Handling:**
    - Definition and concept
    - try, catch, finally, throw, throws
    - Creating user defined Exception class

Unit-3 :   [Teaching Hrs. 15]

- **Threads:**
  - o Definition, concept and life cycle (Various states)
  - o Thread Class and its methods
  - o Multithreading implementation and Synchronization
  - o Deamon Thread, Non-Deamon Thread
- **Stream:**
  - o Introduction
  - o Types (Input, Output,Character, Byte)
- **Applets:**
  - o Introduction to Applet
  - o Applet Life Cycle o Implement & Executing Applet with Parameters
    - ▪ Playing Audio Example
  - o Graphics class
- **Layout Managers:**
  - o FlowLayout
  - o BorderLayout
  - o CardLayout
  - o GridLayout
  - o GridBagLayout
  - o Introduction to other layouts(BoxLayout, SpringLayout, GroupLayout)
  - o Using NO LAYOUT Manager

Unit-4 :   [Teaching Hrs. 15]

- **Creating GUI using swing:**
  - o Introduction to AWT and Swing
  - o Difference Between AWT and Swing
  - o Swing Components (JFrame, JPanel, JLabel, JButton, JRadioButton, JcheckBox, JTextField, JpasswordField, JTextArea, JScrollBar, JComboBox, JList, JToggleButton, JTabbedPane, JSlider, JProgressBar, JTextPane)
  - o Menus (JMenuBar, JMenu, JMenuItem)
- **Event handling:**
  - o Introduction and concept
  - o Event Delegation Model
  - o Event Packages (AWT Event Package, Swing Event Package)
  - o Event Classes (ActionEvent, ItemEvent, FocusEvent, MouseEvent, MouseWheelEvent, TextEvent)
  - o Listener Interfaces (ActionListener, ItemListener, FocusListener, KeyListener, MouseListener, MoutMotionListener, TextListener, WindowListener)
  - o Adaptor Classes (FocusAdaptor, KeyAdaptor, MouseAdaptor, MouseMotionAdaptor)

Suggested Reading:

Reference Books: No.	Name	Author / Publication
1	Java: A Beginner's Guide	Herbert Schildt
2	Java The Complete Reference	Herbert Schildt
3	The Java Programming Language	Ken Arnold, James Gosling, David Holmes

Reference Website

- https://www.tutorialspoint.com/java/
- https://www.w3schools.com/java/
- https://www.javatpoint.com/java-tutorial

MAJOR-09 : Programming in JAVA(Practical)

Unit-1 :   **[Teaching Hrs. 30]**

- **Overview:**
    - History and Features of Java
    - JDK, JVM and JRE
    - JDK Tools
    - JIT compiler
    - Java IDE (NetBeans and Eclipse)
    - Byte code and machine code

- **Basic building blocks:**
    - Data Type (Integer, Float, Character, Boolean)
    - Java Tokens (Keyword, Literal, Identifier, Whitespace, Separators, Comments)
    - Operators (Arithmetic, Relational, Boolean Logical, Bitwise Logical, Assignment, Unary, Shift, Special operators)

- **Basics of Java programming:**
    - Writing, Compiling and Executing basic Java Program
    - Java variable and scope of variables
    - Decision Statements (if, switch)
    - Looping Statements (for, while, Do-While)
    - Jumping Statements (break, continue, return)
    - Array (One Dim., Rectangular, Jagged)
    - Command Line Argument

- **OOP Concepts:**
    - Definition and concepts of Class, Object, Encapsulation, Inheritance, Polymorphism
    - Creating and using Class with members
    - Static and Non-Static Members
    - Constructor
    - finalize () method
    - Constructor overloading and Method overloading

Unit-2 :   **[Teaching Hrs. 30]**

- **Inheritance:**
    - Definition, concept and types
    - Universal Class (Object Class)
    - Access Specifies (public, private, protected, default, private protected)
    - Constructors in inheritance
    - Method Overriding

- **Interface:**
    - Definition and concept
    - Defining Multiple Interface in a single program
    - Execution of interface in simple application
    - implementing Hybrid Inheritance program using Interface
    - Nested and Inner Class
    - Abstract and Final Class
    - Normal import and Static Import

- **Java API packages and important classes:**
    - Introduction to API packages
    - Various packages (java.lang, java.util, java.io, java.net, java.awt, java.awt.event, java.applet, java.swing)
    - java.lang Package Classes (Math, Wrapper Classes, String, String Buffer, Number, Package)
    - java.util Package Classes (Random, Date, GregorianCalendar, Vector, HashTable, StringTokenizer, SimpleTimeZone, Stack, Scanner)
    - Creating and Using User Defined package and sub-package

- **Exception Handling:**
    - Definition and concept
    - try, catch, finally, throw, throws
    - Creating user defined Exception class

Unit-3 :   [Teaching Hrs. 30]

- **Threads:**
    - o Definition, concept and life cycle (Various states)
    - o Thread Class and its methods
    - o Multithreading implementation and Synchronization
    - o Deamon Thread, Non-Deamon Thread
- **Stream:**
    - o Introduction
    - o Types (Input, Output,Character, Byte)
- **Applets:**
    - o Introduction to Applet
    - o Applet Life Cycle o Implement & Executing Applet with Parameters
        - ▪ Playing Audio Example
    - o Graphics class
- **Layout Managers:**
    - o FlowLayout
    - o BorderLayout
    - o CardLayout
    - o GridLayout
    - o GridBagLayout
    - o Introduction to other layouts(BoxLayout, SpringLayout, GroupLayout)
    - o Using NO LAYOUT Manager

Unit-4 :   [Teaching Hrs. 30]

- **Creating GUI using swing:**
    - o Introduction to AWT and Swing
    - o Difference Between AWT and Swing
    - o Swing Components (JFrame, JPanel, JLabel, JButton, JRadioButton, JcheckBox, JTextField, JpasswordField, JTextArea, JScrollBar, JComboBox, JList, JToggleButton, JTabbedPane, JSlider, JProgressBar, JTextPane)
    - o Menus (JMenuBar, JMenu, JMenuItem)
- **Event handling:**
    - o Introduction and concept
    - o Event Delegation Model
    - o Event Packages (AWT Event Package, Swing Event Package)
    - o Event Classes (ActionEvent, ItemEvent, FocusEvent, MouseEvent, MouseWheelEvent, TextEvent)
    - o Listener Interfaces (ActionListener, ItemListener, FocusListener, KeyListener, MouseListener, MoutMotionListener, TextListener, WindowListener)
    - o Adaptor Classes (FocusAdaptor, KeyAdaptor, MouseAdaptor, MouseMotionAdaptor)

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Reference Books: No.	Name	Author / Publication
1	Java: A Beginner's Guide	Herbert Schildt
2	Java The Complete Reference	Herbert Schildt
3	The Java Programming Language	Ken Arnold, James Gosling, David Holmes

Reference Website:

- https://www.tutorialspoint.com/java/
- https://www.w3schools.com/java/
- https://www.javatpoint.com/java-tutorial

MAJOR-10 : DBMS-II

Unit-1 :   **[Teaching Hrs. 10]**

- **SQL View:**
  - o Definition and concept
  - o Creating, Updating and deleting view
- **SQL Sequence:**
  - o Concept and features
  - o Creating, updating, deleting and using Sequence
- **SQL Synonym:**
  - o Definition and Concept
  - o Creating, updating and deleting Synonym
- **SQL Index:**
  - o Definition and Concept
  - o Types (Primary, secondary, cluster)
  - o Advantages and disadvantages of indexing
- **Database Link:**
  - o Definition and Concept
  - o Creating and using database link
- **SQL Cluster:**
  - o Definition and Concept
  - o Creating cluster
  - o Advantages and disadvantages of using cluster
- **SQL Snapshot:**
  - o Definition and Concept
  - o Types
  - o Creating snapshot
  - o Advantages and disadvantages of using snapshot

Unit-2 :   **[Teaching Hrs. 15]**

- **PL/SQL:**
  - o Concept and Features
  - o PL/SQL Block structure
  - o Datatypes, operators and expressions
  - o Variables, constants and literals
  - o Control structures (if-then-else, case, loop, for, while, nested loops)
  - o %TYPE and %ROWTYPE
- **Stored procedures:**
  - o Definition and concept
  - o Creating, Updating, Deleting and Executing Procedure
- **Stored functions:**
  - o Definition and concept
  - o Creating, Updating, Deleting and Executing Function
- **Cursor:**
  - o Definition, concept and types
  - o Attributes and operations
  - o Cursor For loop
- **Database triggers:**
  - o Definition, concept and types
  - o Creating, Updating, Deleting and Executing triggers
- **Packages:**
  - o Definition, concept and types
  - o Creating, Updating and Deleting packages
- **Exception Handling:**
  - o Concept and types
  - o General Syntax of exception block
  - o Raising exception
- **PL/SQL Collection:**
  - o Concept and use
  - o Nested tables and Varrays

Unit-3 :   [Teaching Hrs. 10]

- **Concurrency Control:**
  - Concept and Need
  - Lock:
    - Concept and need
    - Types (shared lock, exclusive lock, DML lock, DDL lock, latch)
  - Deadlock (Concept, avoidance, detection and prevention)
  - Blocking (Concept, avoidance and prevention)
  - Lost Update (Concept, avoidance and prevention)
- **Database Backup and Recovery:**
  - Concept and importance
  - Important files (Date file, Redo log file, Control File, Archive File)
  - Backup strategies (full backup, incremental backup, differential backup)
  - Recovery techniques (rollback, forward recovery, point-in-time recovery)

Unit-4 :   [Teaching Hrs. 10]

- **Database Security and Authorization:**
  - Concept and Need
  - Database security threats and vulnerabilities
  - User Authentication techniques
    - Concept
    - Username and password authentication
    - Biometric authentication
    - Certificate based authentication
    - Operating System authentication
  - Authorization mechanisms
    - Concept
    - Access control at different levels (Database, object, statement, row)
    - Techniques (Access Control Lists, User role, Grant/Revoke Statements)
  - Encryption and decryption techniques (Single key, public key, hashing, application-level encryption)
- Database auditing and Monitoring
  - Database auditing
    - Concept and purpose
    - Techniques (SQL Profiling and Monitoring, Transaction Logging, third party solutions)
  - Database monitoring
    - Concept and purpose
    - Techniques (Security and Compliance Monitoring, storage monitoring, Query Performance Monitoring, Performance Metrics Monitoring)

Practical :   [Teaching Hrs. 30]

Suggested Reading:

Reference Books: No.	Name	Author / Publication
1	Oracle Database the Complete Reference	Bob Bryla, Kevin Loney – Oracle Press
2	Oracle Database SQL	Jason Price – Oracle Press

Web site References:
- https://www.geeksforgeeks.org/sql-tutorial/
- https://www.javatpoint.com/sql-tutorial
- https://www.tutorialspoint.com/sql/index.html

MINOR-03 : Programming with C#.Net

Unit-1 :   [Teaching Hrs. 10]

- **.Net Framework:**
  - Introduction and features
  - Architecture
  - Components (CLR, CTS, CLS, BCL, FCL, IL, Metadata, Namespace, Assembly, JIT and its types, Reflection, Garbage collection)
  - Managed Code and Unmanaged Code

- **Visual Studio:**
  - Introduction and features
  - IDE
  - Types of Projects in IDE (Console, Windows, Web, Setup, etc.)

- **Basics of C#:**
  - Data Types (Value Type & Reference Type)
  - Boxing and UnBoxing
  - Operators (Arithmetic, Relational, Bitwise, etc.)
  - Arrays (One Dimensional, Rectangular, Jagged)
  - Strings (mutable and immutable)
  - Decisions (If types and switch case)
  - Loops (for, while, do..while, foreach)
  - Structures
  - Creating Pointer (Unsafe Code)

Unit-2 :   [Teaching Hrs. 10]
- **OOP Concepts:**
- Concept of Class, Object, Encapsulation, Inheritance, Polymorphism
- Creating Class and Objects
- Methods with "ref" and "out" parameters
- Static and Non-Static Members
- Constructors and destructors
- Inheritance
  - Concept and types
  - Sealed Class & Abstract Class
  - Overriding Methods
- Polymorphism
  - Definition and concept
  - Types (Static, dynamic)
  - Implementation of static polymorphism by overloading Constructor, Method and Operator
  - Implementation of dynamic polymorphism by method overriding
- Interface
  - Definition and concept
  - Implementation
- Creating and using Property
- Creating and using Delegates (Single / Multicasting)
- Creating and using Events with Event Delegate
- Collections (ArrayList, HashTable, Stack, Queue, SortedList)

Unit-3 :   [Teaching Hrs. 10]
- **Windows programming:** Creating windows Application
  - MessageBox With DialogResult class
  - Basic Introduction to Form and properties
  - Adding various Events with event parameters
  - Different Windows Controls (Button, Label, TextBox, RadioButton, CheckBox, ComboBox, ListBox, PictureBox, ScrollBar, TreeView, Menu (MenuStrip, ContextMenuStrip), TolpStrip, Timer, Panel and GroupBox
  - Dialog Boxes (ColorDialog, FontDialog, SaveFileDialog and OpenFileDialog)
  - MDI Concept with MDI Notepad (RichTextBox)
  - Concept of inheriting forms

Unit-4 :   [Teaching Hrs. 15]
- **Database Programming with ADO.NET:**
  - Concept of Connected and Disconnected Architecture
  - ADO.NET Architecture
  - Data Providers in ADO.NET

- o Connection Object
- o Connected Architecture
  - Command, DataReader
- o Disconnected Architecture
  - DataAdapter, DataSet, DataTable , DataRow, DataColumn, DataRelation, DataView
- o Data Binding
- o GridView Programming
- **User Controls:**
  - o Creating User Control with Property, Method, Event
  - o Using User Control in Windows, Projects as component
- **Crystal Reports:**
  - o Creating Crystal Reports
  - o Types of Reports
  - o Report Sections
  - o Formula, Special Field and Summary in Report
- **Setup Project:**
  - o Creating Setup Project
  - o File System Editor
  - o User Interface Editor
  - o Launch Conditions Editor

Practical   [Teaching Hrs. 30]

Suggested Reading:

Reference Books: No.	Name	Author / Publication
1	Pro C# 5.0 and .NET 4.5 Framework	Andrew Troelsen
2	C#.NET Programming Black Book	steven holzner –dreamtech publications
3	Programming in C#	E Balagurusamy

Website References:
1. https://www.tutorialspoint.com/csharp
2. https://www.tutorialsteacher.com/csharp/csharp-tutorials
3. https://www.javatpoint.com/c-sharp-tutorial

SEC-04 : Operating System

Unit-1 :   [Teaching Hrs. 05]
- **Operating System:**
  - o Definition and concept
  - o Functions and objectives of OS
  - o Types of OS
- **Process Management:**
  - o Definition and concept
  - o Process and State Transition Diagram
  - o Process Scheduling algorithm (FCFS, SJN, Round Robin, Priority based Scheduling)
  - o Interposes communication and synchronization.
- **Memory Management:**
  - o Memory allocation concept
  - o Memory allocation Strategies (Paging, segmentation)
  - o Physical and Virtual Memory

Unit-2 :   [Teaching Hrs. 10]
- **Programming with Unix/Linux operating system:**
  - o Introduction
    - History, evolution and features of Unix and Linux
    - Comparison with other operating systems

- o File System
  - File system hierarchy
  - File & Directory Permissions
  - Login commands (passwd, logout, who, who am i, clear)
  - Basic file operations (create, delete, copy, move)
  - File and directory commands (ls, echo, cat, cd, pwd, mv, cp, rm, rmdir, mkdir, umask, chmod, chown, chgrp, find, pg, more, less, head, tail, wc, touch)
- o Basics of Shell programming
  - Shell Keywords, Variables (Shell, User, System) and operators
  - Creating interactive shell script
  - Decision Statements (if then fi, if then else fi, if then elif else fi, case esac)
- o Looping Statements (for loop, while loop, until loop, break, continue)

Unit-3 : Practical   [Teaching Hrs. 30]

Suggested Reading:
1. Operating System by William Stallings.
2. Unix Shell Programming by Y. Kanetkar.

Website References:
1. https://www.geeksforgeeks.org/operating-systems/
2. https://www.tutorialspoint.com/operating_system/index.htm
3. https://www.geeksforgeeks.org/essential-linuxunix-commands/
4. https://www.tutorialspoint.com/unix/shell_scripting.html

Paper Style (For the Subject with Credit 2)

Ques. No.	Particulars	From which Unit	Marks
1	Questions (Any Two Out of Four)	1	10
2	Questions (Any Two Out of Four)	1	10
3	Questions (Any Two Out of Four)	From each Unit	05
Total Marks			**25**

Paper Style (For the Subject with Credit 4)
(Major/Minor/MDC Paper Evaluation Scheme and Distribution of marks)

EXTERNAL ASSESSMENT BY UNIVERSITY		
Que. No.	**Particulars**	**Marks**
Q-1	Questions from Unit-1(Any Two out of Four)	10
Q-2	Questions from Unit-2(Any Two out of Four)	10
Q-3	Questions from Unit-3(Any Two out of Four)	10
Q-4	Questions from Unit-4(Any Two out of Four)	10
Q-5	Questions from Unit-5(Any Two out of Four)	10
Total Marks		**50**

College of Computer, Science & Information Technology - Junagadh

AFFILIATED TO BHAKTA KAVI NARSINH MEHTA UNIVERSITY

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College of Computer, Science & Information Technology - Junagadh

AFFILIATED TO BHAKTA KAVI NARSINH MEHTA UNIVERSITY

C C S I T

✦ **Syllabus (NEP-2020)** ✦

Ability Enhancement Course
& Value Added Course

[B.C.A. & B.Sc.(IT) & B.Sc.]

[Semester – III & IV]

Academic Year : 2024 – 25

(Effective from June – 2024)

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Phone : 92280 06940, 79906 61530

SEMESTER - III

AEC-3 : ENGLISH LANGUAGE & GRAMMAR–1

Table of Contents

Unit No.	Syllabus Contents	Teaching Hours
1	**Short stories:** The Secret of Culture by Munshi Premchand (https://www.arvindguptatoys.com/arvindgupta/ruskin-stories.pdf) The Last Question by Issac Asimov (https://users.ece.cmu.edu/~gamvrosi/thelastq.html) **Essays:** Why We Crave Horror Movies by Stephen King (https://faculty.uml.edu/bmarshall/lowell/whywecravehorrormovies.pdf) Ebooks v paper by Julian Baggini • (https://www.ft.com/content/53d3096a-f792-11e3-90fa-00144feabdc0#axzz35eMWcGoS)	15
2	**Grammar:** Active-Passive voices **Composition:** Report writing • (List of topics has been given)	15

Suggested Reading:
1. Intermediate English Grammar: Reference and Practice for South Asian Students by Raymond Murphy. Cambridge University Press
2. Business Communication by Urmila Rai and S.M. Rai. Himalaya Publishing House
3. Effective Technical Communication by M Ashraf Rizvi. Tata Mc Graw hill
4. Spoken English: A Foundation Course by Kamlesh Sadanand and Susheela Punitha (Part I and Part II)

Topics for report writing:
1. **Cultural Festivals:** Describe a cultural festival celebrated in your community or country.
2. **Sports Events:** Report on a recent sports event such as a cricket match, football game, or tennis tournament.
3. **Concerts or Music Festivals:** Write about a concert or music festival you attended, describing the performers and atmosphere.
4. **School or University Events:** Report on a school play, science fair, or university lecture.
5. **Art Exhibitions:** Write about an art exhibition you visited, discussing the artworks and artists.
6. **Charity Events:** Report on a charity run, fundraiser, or volunteer activity you participated in.
7. **Film Screenings or Premieres:** Describe a film screening or premiere you attended, discussing the movie and audience reactions.
8. **Science or Technology Conferences:** Write about a conference or expo focused on science, technology, or innovation.
9. **Book Fairs or Literary Events:** Report on a book fair or literary event you attended, discussing authors and books.

Paper Style:

Ques. No.	Particulars		Marks
Q.1	Short notes based on texts, any 2 from asked 4. **(Unit-1)**		10
Q.2	(A) Change the voice.- any 5 from given 7 (B) Write a report, any 1 from given 2.	**(Unit-2)**	10
Q.3	Students will answer 5 **MCQ/One liner** question from seven asked, each carrying 1 mark. **(Unit-1)**		05
	Total Marks		25

VAC : INDIAN KNOWLEDGE SYSTEM-2(IKS)
INDIAN MYTHOLOGY : AVATARS

Purposes:
1. Students develop social consciousness for the preservation of youth.
2. As the universe moves along the path of innumerable literal impulses.

Course Objectives:
- To expose students to rich cultural knowledge f avatars
- To understand myth and message behind each avatar tale
- To understand concept of avatars in modern light
- To spread awareness on Indian knowledge system

Course Learning Outcomes:
- After completion of the course:
- Students will be able to understand the concept of avatar in Indian mythology.
- Students will be able to identify myths and message behind them.
- Students will be able to understand impact of myth on public life.
- Students will be able to evaluate Indian myths on avatars and their modern retelling.

Course Contents:

Unit No.	Syllabi	Teaching Hours
1	• Matsya avatar • Kurma avatar • Varah avatar • Narsimha avatar • Vamana avatar	15
2	• Parashuram avatar • Rama avatar • Krishna avatar • Buddha avatar • Kalki avatar	15

Suggested Reading:
1. Mythology of Vishnu and His Incarnations by M. L. Varadpande
2. Indian Mythology by Devdutt Pattanaik
3. Unusual Tales from Indian Mythology by Sudha Murty
4. Indian Mythology: Vedic and Puranic by William Wilkins

Paper Style:

Question No.	Particulars	From which Unit	Teaching Hours
1	Students will answer two questions from given four, each carrying 5 marks.	1	10
2	Students will answer two questions from given four, each carrying 5 marks.	2	10
3	Students will answer 5 MCQ/One liner question from seven asked, each carrying 1 mark.	From each Unit (3/4 from Unit-1 and 3/4 from Unit-2)	05
Total Marks			**25**

SEMESTER - IV

AEC-4 : ENGLISH LANGUAGE & GRAMMAR–2

Table of Contents

Unit No.	Syllabus Contents	Teaching Hours
1	**Short stories:** 1. The Story of an Hour by Kate Chopin (https://archive.vcu.edu/english/engweb/webtexts/hour/) 2. The Seventh Pullet by H. H. Munro (Saki) (https://www.arvindguptatoys.com/arvindgupta/ruskin-stories.pdf) **Essays:** 1. On the Phenomenon of Bullshit Jobs: A Work Rant by David Graeber (https://www.strikemag.org/bullshit-jobs/) 2. The Medium Really is the Message by Ezra Klein (https://www.nytimes.com/2022/08/07/opinion/media-message-twitter-instagram.html)	15
2	**Comprehension:** Proverbs **Composition:** Essay writing • (List of topics has been given)	15

Suggested Reading:

1. Intermediate English Grammar: Reference and Practice for South Asian Students by Raymond Murphy. Cambridge University Press
2. Business Communication by Urmila Rai and S.M. Rai. Himalaya Publishing House
3. Effective Technical Communication by M Ashraf Rizvi. Tata Mc Graw hill
4. Spoken English: A Foundation Course by Kamlesh Sadanand and Susheela Punitha (Part I and Part II)

List of topics for essay writing: (in 350 to 450 words)

✓ **Personal Topics:**
✓ **The Influence of Family on My Life:** Discuss how your family has impacted your values, beliefs, and aspirations.
✓ **A Memorable Travel Experience:** Describe a memorable trip you've taken and its impact on your perspective.
✓ **My Dreams and Ambitions:** Reflect on your dreams and aspirations for the future and how you plan to achieve them.
✓ **Critical Topics:**
✓ **The Impact of Social Media on Society:** Analyze the effects of social media on individuals and communities.
✓ **Media Influence on Body Image:** Critically examine the portrayal of body image in the media and its impact on self-esteem.
✓ **The Impact of online shopping on the lifestyle:** Critically evaluate the consequences of online shopping on the individuals and society.

Contemplative Topics:

• **The Meaning of Success:** Contemplate what success means to you and how you measure it.
• **Embracing Change:** Reflect on the inevitability of change and how to adapt to it.
• **The Beauty of Simplicity:** Reflect on the value of simplicity in a complex world.

List of Proverbs:

1. A bird in the hand is worth two in the bush.
2. Absence makes the heart grow fonder.
3. Actions speak louder than words.
4. All good things must come to an end.
5. All is fair in love and war.
6. All that glitters is not gold.
7. An apple a day keeps the doctor away.
8. As you sow, so shall you reap.
9. Beggars can't be choosers.
10. Better late than never.
11. Better safe than sorry.
12. Birds of a feather flock together.
13. Blood is thicker than water.
14. Charity begins at home.
15. Cleanliness is next to godliness.
16. Curiosity killed the cat.
17. Don't bite the hand that feeds you.
18. Don't count your chickens before they hatch.
19. Don't cry over spilled milk.
20. Don't put all your eggs in one basket.
21. Easy come, easy go.
22. Every cloud has a silver lining.
23. Every dog has its day.
24. Every man for himself.
25. Fortune favors the bold.
26. Haste makes waste.
27. Honesty is the best policy.
28. If the shoe fits, wear it.
29. If you can't beat them, join them.
30. Ignorance is bliss.
31. It's never too late to learn.
32. It's raining cats and dogs.
33. Kill two birds with one stone.
34. Let sleeping dogs lie.
35. Money doesn't grow on trees.

Paper Style:

Question No.	Particulars	From which Unit	Teaching Hours
1	Students will answer two questions from given four, each carrying 5 marks.	1	10
2	(A) Identify the meaning of given proverbs and write it in one sentence, any 5 from given 7. (B) Write an essay in around 350 to 450 words, any one from given three.	2	10
3	Students will answer **5 MCQ/One liner** question from seven asked, each carrying 1 mark.	From each Unit (3/4 from Unit-1 and 3/4 from Unit-2)	05
Total Marks			**25**

VAC-2 : AGRI. ENGINEERING
(ENVIRONMENTAL SCIENCE-2)

હેતુઓ:-

- વિદ્યાર્થીઓ પર્યાવરણ સંરક્ષણનું મહત્વ સમજે
- વિદ્યાર્થીઓ પ્રાકૃતિક સંપતિનું મહત્વ સમજી અને તેનો વિવેકપૂર્વક ઉપયોગ કરવાની સમજ કેળવે.
- વિદ્યાર્થીઓ પ્રદૂષણ વિષે ખ્યાલ મેળવે.
- વિદ્યાર્થીઓ પર્યાવરણના સામાજિક પ્રશ્નોથી માહિતગાર બને.

ક્ષમતાઓ:-

- વિદ્યાર્થીઓ પર્યાવરણના જુદા જુદા ઘટકો વિષે સમજાવી શકે.
- વિદ્યાર્થીઓ પર્યાવરણમાં જન જાગૃતિ કઈ રીતે કરી શકાય તે સમજાવી શકે.
- વિદ્યાર્થીઓ પર્યાવરણ માટેના જુદા જુદા ભીત સૂત્રો લખી શકે.
- વિદ્યાર્થીઓ પર્યાવરણના પ્રદૂષણો વિષે સમજાવી શકે.

Course Contents:

Unit No.	Syllabi	Teaching Hours
1	**પર્યાવરણીય પ્રદૂષણ, વ્યાખ્યા, પ્રકારો** 1. વાયુ પ્રદૂષણ, કારણો, અસર અટકાવવાના ઉપાયો 2. જળ પ્રદૂષણ, કારણો, અસર અટકાવવાના ઉપાયો 3. ધ્વનિ પ્રદૂષણ, કારણો, અસર અટકાવવાના ઉપાયો	**15**
2	**પર્યાવરણ અને સામાજિક પ્રશ્નો** 1. વસ્તી વધારો અને પર્યાવરણ શહેરીકરણ 2. શહેરીકરણ અને ઉર્જા 3. પર્યાવરણ અને આરોગ્ય, HIV/AIDS 4. સામાજિક વનીકરણ	**15**

Suggested Reading:

1. પર્યાવરણશાસ્ત્ર – બીપીનભાઈ જોશી
2. પર્યાવરણ અને ભૂકંપ ઈજનેરી – ડો.
3. જંગલોની મુલાકાત લઈ અભ્યાસ કરવો.
4. Ecology and Environmental – P. D. Sharma Rastogi

Paper Style:

Ques. No.	Particular	Marks
Q. 1	(A) Essay Type Question. (From Unit-1)	**10**
	OR	
	(B) Essay Type Question. (From Unit-1)	**10**
Q. 2	(A) Essay Type Question. (From Unit-2)	**10**
	OR	
	(B) Essay Type Question. (From Unit-2)	**10**
Q. 3	Short Notes. (1/2) (One from each Unit)	**05**
	Total Marks	**25**