Model Curriculum for Three/Four Year Degree Course

(With Multiple Entry /Exit Option)

Based on NEP-2020

B.C.A.

Odisha State Higher Education Council, Bhubaneswar
Government of Odisha

B.C.A.

SEM-I (July-December, 90 Working Days)									
SN	**Code**	**Paper**	**Credit**	**Hours of Instruction**	**Semester-End Theory Marks**	**Continues Evaluation Marks/ Sessional**	**Mid Sem Theory Marks**	**Semester-End Practical Marks**	**Mid Sem Practical Marks**
1	MAJOR-I-P1	Problem Solving Using C Programming	4	60	50	10	10	20	10
2	MAJOR-I-P2	Introduction to Python Programming	4	60	50	10	10	20	10
3	MINOR-I-P1	Digital Logic	4	60	60	20	20	0	0
4	MINOR-I-P2	Business Accounting	4	60	60	20	20	0	0
5	MDC-1	Principles of Management	3	45	60	20	20	0	0
6	MDC-2	Computer Fundamentals	3	45	60	20	20	0	0
7	AEC-1	Odia	4	60	60	20	20	0	0
8	AEC-2	Hindi	4	60	60	20	20	0	0
9	AEC-4	Sanskrit	4	60	60	20	20	0	0
10	AEC-5	Urdu	4	60	60	20	20	0	0
11	VAC-1	Environmental Studies and Disaster Management	3	45	60	20	20	0	0

Distribution of Sessional Marks:

Course Type	Maximum Marks	Mid Semester	Attendance	Surprise Test/Quiz	Assignment/ Presentation
Without Practical	40	20	Above 95% - 5 Marks 85%-94% - 4 Marks 75%-84% - 3 Marks	10	5
With Practical	30	20		5	Nil

SEM-II									
(Jan-June, 90 Working Days)									
SN	**Code**	**Paper**	**Credit**	**Hours of Instruction**	**Semester-End Theory Marks**	**Continues Evaluation Marks/ Sessional**	**Mid Sem Theory Marks**	**Semester-End Practical Marks**	**Mid Sem Practical Marks**
1	MAJOR-I-P1	Data Structures	4	60	50	10	10	20	10
2	MAJOR-I-P1	Object Oriented Programming Using C++	4	60	50	10	10	20	10
3	MINOR-I-P1	Business Economics	4	60	60	20	20	0	0
4	MDC-12	Environmental Education	3	45	60	20	20	0	0
5	AEC-1	English	4	60	60	20	20	0	0
6	SEC-1	Analytical Ability and Reasoning	3	45	60	20	20	0	0

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Course Type	Maximum Marks	Mid Semester	Attendance	Surprise Test/Quiz	Assignment/ Presentation
Without Practical	40	20	Above 95% - 5 Marks 85%-94% - 4 Marks 75%-84% - 3 Marks	10	5
With Practical	30	20		5	Nil

Program Outcomes

PO1: To understand the function of various hardware, software, and network components.
PO2: To develop the ability to analyze, design, and develop computer-based solutions for different application domains.
PO3: To be professionally competent in order to adapt to the fast-changing IT industry.
PO4: To be able to use Internet effectively and develop web-based and mobile applications for wider access.
PO5: To develop entrepreneurship skills and venture into start-ups for providing end-to-end solutions.

NB:

Students have to do the laboratory assignments mentioned under different subjects/papers. In order to make the subject more interesting and sync with the current trends in the subject, the course instructor will give additional assignments relevant to the subject, and students are also encouraged to do some experiments on their own.

Semester I

MAJOR-I-P1: Problem Solving using C Programming

Credit-4

Course Objectives:

- To learn the C programming language to solve different scientific and business problems
- To learn how to design and write effectively codes using various programming constructs available in the C programming language

Learning Outcomes:

Upon completion of this course, students will be able to:

- Gain knowledge about different data types and operators in C language
- Learn the use of various control structures and array
- Learn the use of pointers, functions, and storage classes
- Write programs using structures, union, and files

Unit I:

- Introduction: Introduction to Programming Language, Introduction to C Programming, Keywords & Identifiers, Constants, Variables, Input and Output Operations, Compilation and pre-processing, Data types: Different data types, Data types qualifier, modifiers, Memory representation, size and range, Operators: Operators (Arithmetic, Relational, Logical, Bitwise, Assignment & compound assignment, Increment & Decrement, Conditional), Operator types (unary, binary, ternary). Expressions, Order of expression (Precedence and associativity)

Unit II:

- Decision Control structures & Loops: Decision Making and Branching statements (Simple IF, IF…ELSE, Nested IF… ELSE, ELSE … IF ladder), Selection control structure (Switch Statement). Looping statements (FOR, WHILE, DO…WHILE), break, continue and GOTO statements
- Array: Concept of Array, Array Declaration, types of arrays (one and multiple dimension), Character Arrays and Strings, limitation of array.

Unit III:

- Pointers: Concept of Pointer (NULL pointer, wild pointer, dangling pointer, generic pointer), Pointer Expressions, Accessing the Address of a Variable, Declaring Pointer Variables, Initializations of Pointer Variable, accessing a Variable through its Pointer, Pointer arithmetic, Pointer representation of array, Array of Pointers, Accessing Sting using Pointer.
- Function: Types of Function, Function Declaration, Function Definition, Function Call, Recursive Function, Dynamic Memory Management functions, String handling function (strlen, strcmp, strcpy, strncpy, strcat, strstr).
- Storage class: Types (auto, register, static, extern), scope rules, declaration and definition.

Unit IV:

- Structure and Union: Defining, Declaring, Accessing, Initialization Structure, nested structure, self-referential structure, bit-field, Arrays of Structures, Structures and Functions, structures and pointers, Unions, difference between structure and union, structure within union. File: File Management in C, Defining and Opening a File, File opening modes (read, write, append), Closing a File, File operations, Error handling during I/O Operations, sequential and random access files. Command line arguments.

Text Books:

- ✓ *Programming in ANSI C by E. Balagurusamy, TMH*
- ✓ *Let us C by Yashavant Kanetkar, BPB Pubs.*
- ✓ *The C Programming Language by B. Kernighan & Dennis Ritchie, PHI.*

Reference Books:

- ✓ *C: How to Program by Paul Deitel, Harvey Deitel, Prentice Hall.*
- ✓ *Programming using C by P.C. Sethi & P.K. Behera, Kalyani Publisher.*

BCA 1.1 Lab: Problem Solving using C Programming

1. Write a Program to find greatest among three numbers.
2. Write a Program to all arithmetic operation using switch case.
3. Write a Program to print the sum and product of digits of an integer.
4. Write a Program to reverse a number.
5. Write a Program to compute the sum of the first n terms of the following series
   S = 1+1/2+1/3+1/4+……
6. Write a Program to compute the sum of the first n terms of the following series
   S =1-2+3-4+5…….
7. Write a function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.
8. Write a function to find whether a given number is prime or not. Use the same to generate the prime numbers less than 100.
9. Write a Program to compute the factors of a given number.
10. Write a program to swap two numbers.
11. Write a Program to print a triangle of stars as follows (take number of lines from user):
    *
    ***
    *****
    ****
12. Write a Program to perform following actions on an array entered by the user:
    a) Print the even-valued elements
    b) Print the odd-valued elements
    c) Calculate and print the sum and average of the elements of array
    d) Print the maximum and minimum element of array
    e) Remove the duplicates from the array
    f) Print the array in reverse order
13. The program should present a menu to the user and ask for one of the options. The menu should also include options to re-enter array and to quit the program.
14. Write a Program that prints a table indicating the number of occurrences of each alphabet in the text entered as command line arguments.
15. Write a program that swaps two numbers using pointers.
16. Write a program in which a function is passed address of two variables and then alter its contents.
17. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main( ) function.
18. Write a program to find sum and average of n elements entered by the user. To write this program, allocate memory dynamically using malloc( ) / calloc( ) functions.
19. Write a menu driven program to perform following operations on strings:
    a) Show address of each character in string
    b) Concatenate two strings without using strcat function.
    c) Concatenate two strings using strcat function.
    d) Compare two strings
    e) Calculate length of the string (use pointers)
    f) Convert all lowercase characters to uppercase
    g) Convert all uppercase characters to lowercase
    h) Calculate number of vowels
    i) Reverse the string
20. Given two ordered arrays of integers, write a program to merge the two-arrays to get an ordered array.
21. Write a program to copy the content of one file to other.

MAJOR-I-P2: Introduction to Python Programming

Credit-4

Course Objectives:

- To gain a solid understanding of basic programming concepts of Python.
- To understand and write programs using Python.
- Apply Python programming skills to develop practical, real-world applications and projects.

Learning Outcomes:

Upon completion of this course, Students will be able to learn:

- Basics of Python construct.
- Basics of decision making and looping, use of list, set, tuples and dictionary
- Creation and use of functions
- Object-oriented concepts, handling exceptions, operations on files

Unit I:

- Introduction to Python, getting started with Python, Python Basics: Identifiers, Keywords, Python types, basic types, mutable and immutable types, Integer & float ranges, Variable type & assignment, Arithmetic Operators, Precedence & Associativity, Conversions, built-in functions, modules, container types, comments & indention, multi-lining.
- Strings: Introduction, Accessing String elements, Properties, built-in functions, Methods, Conversions, Comparisons. Console I/O: I/O operations, formatted printing.

Unit II:

- Decision Control Instruction: Logical operators, Conditional Expressions, all() & any(), receiving input, pass statement. Repetition Control Instruction: types, usage of loops, break & continue, else block of a loop.
- Lists, Sets, Tuples, Dictionaries: creating, accessing, and looping-in each type. Applying basic operations, using built-in functions and methods on each type, possible data structure / mathematical operations on each type. Comprehensions on List, Set, and dictionary.

Unit III:

- Functions: built-in and user-defined functions, invoking functions, unpacking arguments. Recursive function, iteration vs recursion. Lambda functions, map, filter, reduce function.
- Modules and Packages: Main module, importing a module, packages, programs using modules and packages.

Unit IV:

- Classes & Objects: Programming paradigms, public and private members, declaring classes, creating objects, class variables, methods, operator overloading, containership, features and types of inheritance.
- Exception Handling: Introduction, handling exception, user-defined exceptions, else block, finally block. File Input/Output: Opening a file, modes of opening a file, operations: reading, writing. Use of *with* keyword.

Text Book:

- ✓ *Let us Python by Yashavant Kanetkar & Aditya Kanetkar, BPB Pub.*

Reference Books & e-Resources:

- ✓ *Python Programming: Using Problem Solving Approach by Reema Thareja, Oxford University Press*https://docs.python.org

BCA 2.1 Lab: Introduction to Python Programming

1. Write a program to demonstrate the usage of various arithmetic operators.
2. Write a program that will convert various temperatures.
    a. Fahrenheit to Centigrade
    b. Centigrade to Fahrenheit
3. Write a program that will find the roots of a quadratic equation: $ax^2 + bx + c = 0$
4. Write a program that demonstrate the usage of various String functions.
5. Write a program that will ask you to enter your name, through keyboard, and perform following operations
    a. Find the middle name
    b. Find the last name (using string slicing)
    c. Re-write the name with surname first.
6. Write a program to find out whether the integer entered by the user, through the keyboard, is even or odd number.
7. Find out the youngest among Shyam, Dugu and Ishan whose ages are entered by the user through keyboard.
8. Given three points (x1, y1), (x2, y2), (x3, y3), write a program to check all the three points fall on one straight line.
9. Write a program to demonstrate basic operations on the list.
10. Write a program to demonstrate stack and queue operations using a list of numbers.
11. Write a program to ask the data of five students that contain name, roll number, age. Sort the list based on roll number of the Student. [Note: Use list of lists].
12. Write a program to demonstrate basic operations on the tuple.
13. Store the data about the shares held by the user as tuples containing the following information about shares: share name, cost price, number of shares, selling price. Write a program to determine:
    a. total cost of the portfolio
    b. total amount gained or lost
14. Write a program to demonstrate basic operations on the set.
15. Write a program to demonstrate basic operations on the dictionary.
16. Create a dictionary to store data (name, roll number) of N students. The key will be the roll number of the student and the value contains the data of the student (in a list). Write a program that asks the user to enter a name of a Student, search it in the dictionary and print the data of the Student if it is available otherwise display an appropriate message.
17. Write a program to demonstrate basic comprehensions on list, set and dictionary.
18. Write a program to find the factorial value of a number entered by the user using function.
19. Write a program to find the factorial of a number using recursion.
20. Write a program to showcase use of Lambda functions, map, filter, reduce function.
21. Create a Python class called "Student" that encapsulates various attributes of a student. Implement methods within the class to perform operations utilizing these attributes.
22. Write a program to demonstrate both Static and Dynamic Polymorphism in Python.
23. Write a program to demonstrate exception handling mechanisms for various types of exceptions.
24. Write a program to read texts from a file and write them into another file.

MINOR-I-P1: Digital Logic and Circuit Design
Credit-4

Course Objectives:

- To provide a foundational understanding of digital logic and Circuit design.
- To learn number systems, Boolean algebra, logic gates, and Boolean function simplification using Karnaugh maps and the tabulation method.
- To design and analyze combinational circuits, such as adders, subtractors, encoders, and multiplexers.
- To design and analyze sequential circuits like flip-flops, counters, and shift registers.

Learning Outcomes:

- After completion of this course the students will be able to:
- Gain proficiency in understanding and converting between number systems such as binary, octal, and hexadecimal, and performing binary arithmetic operations.
- Master the principles of Boolean algebra and logic gates, and simplify Boolean functions using Karnaugh maps and the tabulation method.
- Develop skills in designing and analyzing combinational circuits, including adders, subtractors, encoders, decoders, multiplexers, etc.
- Understand and design sequential circuits, including various types of flip-flops, counters, and shift registers.
- Acquire competencies essential for creating efficient digital systems, crucial for developing modern electronics, computers, and embedded systems used in various practical applications in today's technology-driven world.

Unit I:

- Number System: Weighted and Unweighted Codes, Binary, Octal, and Hexadecimal numbers; Fixed- and Floating-Point Number Representations, number base conversion, Complements, Binary Arithmetic: Addition, Subtraction, Multiplication and Division, BCD Code.

Unit II:

- Boolean algebra and Logic Gates: Introduction to Boolean algebra, laws of Boolean algebra, logic gates, universal logic gates, POS and SOP notations, Canonical logic forms. Simplification of Boolean Functions: Laws of Boolean algebra and K-Maps, Tabulation Method.

Unit III:

- Combinational Circuits: Design Procedure of Combinational Circuits, Adders, Subtractors, Code Converters, Magnitude Comparator, Encoder, Decoder, Multiplexer, Demultiplexer, ROM.

Unit IV:

- Sequential Circuits: Flip-Flops: SR, D, JK, T, Master/Slave F/F, Edge-trigerred F/F, Excitation Tables; Registers, Counters: synchronous and asynchronous, Design of Counters, Shift Registers, RAM.

Texts / References Books:

- ✓ *Mano, M. M. Digital logic and computer design. PHI.*
- ✓ *Mano, M. M., & Kime, C. R..Logic and computer design fundamentals. Pearson.*
- ✓ *Malvino, A., & Leach, D. Digital principles and applications. McGraw-Hill.*
- ✓ *Bartee, T. C. Digital computer fundamentals. McGraw-Hill.*

MINOR-I-P2: Business Accounting
Credit-4

Course Objectives:

- To impart the basic business accounting knowledge.

Unit I:

- **Introduction:** Financial Accounting-definition and Scope, objectives of Financial Accounting, Accounting v/s Book Keeping terms used in accounting, users of accounting information and limitations of Financial Accounting.
- **Conceptual Framework:** Accounting Concepts, Principles and Conventions, Accounting Standards concept, objectives, benefits, brief review of Accounting Standards in India, Accounting Policies, Accounting as a measurement discipline, valuation Principles, accounting estimates.

Unit II:

- **Recording of transactions:** Voucher system; Accounting Process, Journals, Subsidiary Books, Ledger, Cash Book, Bank Reconciliation Statement, Trial Balance.
- **Depreciation:** Meaning, need & importance of depreciation, methods of charging depreciation.

Unit III:

- **Preparation of final accounts:** Preparation of Trading and Profit & Loss Account and Balance Sheet of sole proprietary business

Unit IV:

- **Introduction to Company Final Accounts:** Important provisions of Companies Act, 1956 in
  respect of preparation of Final Accounts, Understanding of final accounts of a Company.
- **Computerized Accounting:** Computers and Financial application, Accounting Software packages, An overview of computerized accounting system - Salient features and significance, Concept of grouping of accounts, Codification of accounts, Maintaining the hierarchy of ledger, Generating Accounting Reports.

Text Books:

- ✓ *Anil Chowdhry, "Fundamentals of Accounting & Financial Analysis", Pearson Education*
- ✓ *Rajesh Agarwal, R. Srinivasan, "Accounting Made Easy", TMH*

Reference Books:

- ✓ *Amrish Gupta, "Financial Accounting for Management", Pearson Education*
- ✓ *S. N. Maheshwari, "Financial Accounting for Management: Vikas Publishing House*

MDC-1: Principles of Management
Credit-3

Course Objectives:
- To understand the basic principles of management
- To provide an insight into different management functions and strategies

Learning Outcomes:
Upon completion of this course, students will be able to:
- Understand the evolution management and various school of thoughts
- Learn different management functions and decision-making process
- Know about different leadership styles and importance of co-ordination
- Learn about the need for strategic management

Unit I:
- Nature of Management: Meaning, Definition, its nature purpose, importance & Functions, Management as Art, Science & Profession- Management as social System Concepts of management-Administration- Organization. Evolution of Management Thought: Contribution of F.W. Taylor, Henri Fayol, Elton Mayo, Chester Barhard& Peter Drucker to the management thought. Various approaches to management (i.e. Schools of management thought) Indian Management Thought.

Unit II:
- Functions of Management (Part-I) Planning - Meaning - Need & Importance, types levels– advantages & limitations, Forecasting - Need & Techniques, Decision making - Types - Process of rational decision making & techniques of decision making. Organizing - Elements of organizing & processes: Types of organizations, Delegation of authority - Need, difficulties in delegation – Decentralization.

Unit III:
- Functions of Management (Part-II) Staffing - Meaning & Importance, Direction - Nature – Principles, Communication - Types & Importance, Motivation - Importance – theories, Leadership - Meaning - styles, qualities & functions of leaders. Controlling- Need, Nature, importance, Process & Techniques, Coordination - Need, Importance.

Unit IV:
- Strategic Management Definition, Classes of Decisions, Levels of Decision, Strategy, Role of different Strategist, Relevance of Strategic Management and its Benefits, Strategic Management in India.

Text Books:
- ✓ *Essential of Management by Horold Koontz &IteinzWeibrich, McGraw-Hills International.*
- ✓ *Essential of Business Administration by K. Aswathapa, Himalaya Publishing House.*

Reference Books:
- ✓ *Principles & Practice of Management by L.M. Prasad, Sultan Chand & Sons pub.*
- ✓ *Principles of Management by Tripathi & Reddy, Tata McGraw Hil.*

MDC-2: Computer Fundamentals
Credit-3

Course Objectives:
- Introduce number systems and data representation
- Understand functional units and components of computer
- Introduce the emerging technologies

Learning Outcomes:
Upon completion of this course, students will be able to:
- Understand the basic organization of a computer and the number system
- Learn about the working of commonly used input-output and memory devices
- Understand the role of Operating system and Computer Networks
- Know about some of the emerging computing technologies and web services

UNIT-1:
- Computer Basics: Simple Model of a Computer, Characteristics of Computers, Hardware and Software, working of a Computer, Stored Program Concept, Problem Solving with computer: Flowchart, Algorithms, Programming,
- Computer Software: Introduction to computer software, classification of computer software, system software, application software, firmware, middleware

UNIT-2:
- Input/output Units: Input devices, Output devices, Computer Memory: Introduction, Read Only Memory, Serial Access Memory, Cache memory, primary memory, secondary storage devices, magnetic tapes, hard disks, SSD, optical drives, USB flash drivers, Memory cards, Mass storage devices, Memory Hierarchy.

UNIT-3:
- Operating Systems: Definition, Batch Operating System, Multiprogramming Operating System, Time Sharing Operating System, Multiprocessing Operating System. Services of OS.
- Computer Networks: Concepts of Networking-LAN, WAN, MAN, Network topologies. Internet and the World Wide Web.

UNIT-4:
- **Emerging Computing Environments:** Peer to Peer Computing, Grid computing, distributed computing, Cloud Computing: Introduction, cloud services, cloud deployment models.
- Email, video conferencing, e-Learning, e-Banking, UPI, e-commerce, e-Governance, social networking, emerging computer applications.

Text Book:
- ✓ *Fundamentals of Computers by V Rajaraman 6th edition PHI Learning Private Limited*

Reference Books:
- ✓ *A First Course in Computers by Sanjay Saxena, Vikas Publishing House.*
- ✓ *Computer Fundamentals by Anita Goel, Pearson pub*

ପ୍ରଥମ ପର୍ଯ୍ୟାୟ (Semester - 1)
ସାମର୍ଥ୍ୟବର୍ଦ୍ଧକ ପାଠ୍ୟକ୍ରମ
Ability Enhancement Course (AEC-1)
ପରିଶୁଦ୍ଧ ଭାଷା ଓ ଲିଖନ ଧାରା
Credit-4

Course Outcome (ପାଠ୍ୟପତ୍ର ଫଳଶ୍ରୁତି):
ସାହିତ୍ୟର ଲିଖନ ଓ ଅଧ୍ୟୟନ କ୍ଷେତ୍ରରେ ଭାଷାର ପରିଶୁଦ୍ଧତା ନିତାନ୍ତ ଆବଶ୍ୟକ | ସାହିତ୍ୟକର୍ମ ବ୍ୟତିରେକ ବିଭିନ୍ନ କ୍ଷେତ୍ରରେ ନିର୍ଭୁଲ ଭାଷା ବ୍ୟବହାର ହେବା ବାଞ୍ଛନିୟ | ଭାରତର ସମ୍ବିଧାନ ଶ୍ରୀକୃତ ଭାଷା ମାନଙ୍କ ମଧ୍ୟରେ ଓଡ଼ିଆ ଭାଷାର ସ୍ଥାନ ଗୁରୁତ୍ୱପୂର୍ଣ| ଶିକ୍ଷାର୍ଥୀ ମାନେ ନିର୍ଭୁଲ ଭାଷା ପ୍ରୟୋଗ କ୍ଷେତ୍ରରେ କିପରି ସମର୍ଥ ହେବେ, ସେଥିନିମନ୍ତେ ଏହି ପାଠ୍ୟପତ୍ରଟି ପରିଚାଳିତ| ବିଭିନ୍ନ ପ୍ରତିଯୋଗିତା ମୂଳକ ତଥା ପ୍ରଶାସନିକ ସେବା ମୂଳକ ନିଯୁକ୍ତି ହେବାପାଇଁ ସମ୍ମୁଖୀନ ହେଇଥିବା ପରିକ୍ଷା ନିମିତ୍ତ ମଧ୍ୟଏହା ଶିକ୍ଷାର୍ଥୀଙ୍କୁ ସାହାଯ୍ୟ କରିବ |

Unit wise Learning Outcome:
୧ମ ଏକକ: କ) ଶବ୍ଦ ଗଠନରେ ଶୁଦ୍ଧତା
ଖ) ରୂଢ଼ିର ଅର୍ଥ ଅବଗତି
ଗ) ରୂଢ଼ିର ପ୍ରୟୋଗବିଧି ଶିକ୍ଷା

୨ୟ ଏକକ: କ) ବାକ୍ୟର ଗଠନରୀତି ଶିକ୍ଷା
ଖ) ବିବିଧ ପ୍ରକାର ବାକ୍ୟ ସମ୍ପର୍କରେ ଧାରଣା
ଗ) ନିର୍ଭୁଲ ବାକ୍ୟଲିଖନବିଦ୍ୟା

୩ୟ ଏକକ: କ) ବୃହତ ଅନୁଚ୍ଛେଦକୁ ସଂକ୍ଷିପ୍ତ କରିବାରେ କୌଶଳ
ଖ) ବିଷୟଗତ ଶୀଷ୍ଟକ ନିର୍ଦ୍ଧାରଣ କଳା
ଗ) ଅନୁଚ୍ଛେଦରୁ ବିଭିନ୍ନ ପ୍ରଶ୍ନର ରଉର ପ୍ରଦାନ

୪ର୍ଥ ଏକକ: କ) ସ୍ତମ୍ଭଲିଖନ ଜ୍ଞାନ
ଖ) ଫିଚର ପ୍ରସ୍ତୁତି
ଗ) ନିର୍ଭୁଲ ପ୍ରତିଲିଖନ ଓ ବିଜ୍ଞାପନ ପ୍ରସ୍ତୁତି କଳା

ପାଠ୍ୟ ବିଷୟ
ପ୍ରଥମ ଏକକ: (କ) ଶବ୍ଦର ସଂଜ୍ଞା, ଶୁଦ୍ଧ ଶବ୍ଦ ଓ ବର୍ଣ୍ଣଶୁଦ୍ଧି
(ଖ) ରୂଢ଼ିର ଅର୍ଥ ଓ ପ୍ରୟୋଗ ବିଧି
ଦ୍ୱିତୀୟ ଏକକ: ବାକ୍ୟ ଗଠନରୀତି ଓ ପ୍ରକାର ଭେଦ
ତୃତୀୟ ଏକକ: ଅନୁଚ୍ଛେଦ ସଂକ୍ଷେପଣ, ଶୀର୍ଷକ ନିର୍ଦ୍ଧାରଣ ଓ ପ୍ରଶ୍ନୋତ୍ତର
ଚତୁର୍ଥ ଏକକ: ନିର୍ଭୁଲ ଲିଖନ ପଦ୍ଧତି, ସ୍ତମ୍ଭ ଲିଖନ, ଫିଚର, ପତ୍ର ଲିଖନ, ବିଜ୍ଞାପନ ପ୍ରସ୍ତୁତି

ସହାୟକ ଗ୍ରନ୍ଥାସ୍ତୁତି (Book of Reference):

୧. ସର୍ବସାର ବ୍ୟାକରଣ – ଶ୍ରୀଧର ଦାସ, ଗ୍ରନ୍ଥ ମନ୍ଦିର, କଟକ |
୨. ସାରସ୍ୱତ ବ୍ୟାବହାରି କବ୍ୟାକରଣ – କୃଷ୍ଣଚନ୍ଦ୍ର ପ୍ରଧାନ, ସତ୍ୟ ନାରାୟଣ ବୁକ ଷ୍ଟୋର୍|
୩. ବୃହତ ଓଡ଼ିଆ ବ୍ୟାକରଣ – ତ୍ରିଲୋଚନ ବେହେରା, ଗୋବିନ୍ଦ ଚନ୍ଦ୍ର ଲେଙ୍କା, ଫ୍ରେଣ୍ଡସ ପବ୍ଲିଶର୍ସ, କଟକ|
୪. ଆଧୁନିକ ଓଡ଼ିଆ ବ୍ୟାକରଣ - ଧନେଶ୍ୱର ମହାପାତ୍ର, କିତାବ ମହଲ, କଟକ
୫. ସାଧାରଣ ଓଡ଼ିଆ ବନାନ ଶୁଦ୍ଧି – ଓଡ଼ିଆ ଭାଷା ପ୍ରତିଷ୍ଠାନ, ଭୁବନେଶ୍ୱର
୬. ଗଣମାଧ୍ୟମ ଓ ଗଣଯୋଗାଯୋଗ – ଶିଶିର ବେହେରା, ଫ୍ରେଣ୍ଡସ ପବ୍ଲିଶର୍ସ, କଟକ
୭. ଯୋଗାଯୋଗ ମୂଳକ ମାତୃଭାଷା – ବିରଞ୍ଚି ନାରାୟଣ ସାମଲ, ସତ୍ୟନାରାୟଣ ବୁକଷ୍ଟୋର୍, କଟକ
୮. ଯୋଗାଯୋଗର ଭାଷା – ସୁଧୀର ଚନ୍ଦ୍ର ମହାନ୍ତି, ପତ୍ରା ପ୍ରକାଶନ, କଟକ
୯. ନିର୍ଭୁଲ ଲେଖାର ମୂଳସୂତ୍ର, ନୀଳାଦ୍ରି ଭୂଷଣ ହରିଚନ୍ଦନ, କିତାବ ମହଲ, କଟକ
୧୦. ଓଡ଼ିଆ ଭାଷା ବ୍ୟାକରଣ ସୌରଭ ,ଚନ୍ଦ୍ରଶେଖର ପତି, ପ୍ରତି ପ୍ରକାଶ, କଟକ

ନମୁନା ପ୍ରଶ୍ନ (Sample Questions):
୧. ଶବ୍ଦ କାହାକୁ କୁହାଯାଏ ? (1 ମାର୍କ)
୨. ପର୍ବତର ଦୁଇଟି ପ୍ରତିସବ୍ଦ ଲେଖ (2 ମାର୍କ)
୩. ବାକ୍ୟର ପ୍ରକାରଭେଦ ଦର୍ଶାଅ (5 ମାର୍କ)
୪. ତୁମ ମହାବିଦ୍ୟାଳୟରେ ଏକ ଶିକ୍ଷକ ନିଯୁକ୍ତିପାଇଁ କୌଣସି ସମ୍ବାଦପତ୍ରରେ ଓଡ଼ିଆ ଭାଷାର କିପରି ବିଜ୍ଞାପନ ଦିଆଯିବ ତାହାର ଏକ ନମୁନା ଲେଖ | (8 ମାର୍କ)

AEC-2: Hindi
Credit-4

प्रयोजनमूलक हिंदी

UNIT - I

प्रयोजनमूलक हिंदी :

प्रयोजनमूलक हिंदी का स्वरूप और परिभाषा, प्रयोजनमूलक हिंदी के भेद, प्रयोजनमूलक हिंदी की विशेषताएँ, प्रयोजनमूलक हिंदी की समस्याएँ और संभावनाएँ

UNIT - II

राजभाषा हिंदी की संवैधानिक स्थिति:

राजभाषा समिति, 1957, राजभाषा के संबंध में राष्ट्रपति के आदेश, 952, 1955, 1960, राजभाषा अधिनियम 1963, राजभाषा अधिनियम 1967, राजभाषा अधिनियम 1976

UNIT - III

कार्यलयी हिंदी:

हिंदी के विविध रूप : राजभाषा, राष्ट्रभाषा, संपर्क भाषा, संचार भाषा, मातृभाषा, सर्जनात्मक भाषा राष्ट्रभाषा और राजभाषा में अंतर, मानक हिंदी

कार्यालयी हिंदी के प्रमुख प्रकार्य

आलेखन: परिभाषा, स्वरूप, विशेषता, प्रारूप

टिप्पण: परिभाषा, स्वरूप, विशेषता, प्रारूप

पत्रलेखन, पल्लवन, संक्षेपण

पारिभाषिक शब्दावली : पारिभाषिक शब्दावली का स्वरूप एवं महत्त्व पारिभाषिक शब्दावली निर्माण के सिद्धांत, पारिभाषिक शब्दावली के भेद, ज्ञान-विज्ञान के विभिन्न क्षेत्रों में प्रयुक्त कुछ निर्धारित पारिभाषिक शब्दाबली

UNIT – IV

हिंदी में कंप्यूटर का अनुप्रयोग:

कंप्यूटर का परिचय, कंप्यूटर की संरचना, कंप्यूटर के प्रकार, कंप्यूटर की उपयोगिता, हिंदी में शब्द संसाधन, हिंदी में डाटा संसाधन, वेब पब्लिशिंग, वेब पेज डिजाइनर

इंटरनेट :

इंटरनेट स्वरूप और विकास इंटरनेट : कार्यप्राणाली, इंटरनेट के संपर्क उपकरणों का परिचय, इंटरनेट एक्सप्लोटर, इंटरनेट की अनुप्रयुक्तता।

लिंक, ई-मेल, ब्राउजिंग, अपलोडिंग, डाउनलोडिंग, न्यू मीडिया, वेब पत्रकारिता, ब्लागिंग, इंटरनेट रिलै चैट, हिंदी के प्रमुख इंटरनेट पोर्टल।

पाठ्य पुस्तक:

1. प्रयोजनमूलक हिंदी- प्रो. राधाकांत मिश्र,
   डॉ. अमूल्य रत्न महांती,
   प्लैनेट वी, हिंदी बुक सेंटर, बादामबाड़ी, कटक

AEC-3:Sanskrit

Credit-4

Functional Sanskrit:

Unit I:

- Sanskrit Alphabets, General Idea about Sanskrit Karaka, Vibhakti, Vacana, Purusa,Pada, Linga, Vacya, Lakara, Upasarga.

Unit II;

- Useful Sanskrit words, Sentence Formation in Sanskrit, Simple Sanskrit Sentences for conversation, Preparation of News in Sanskrit.

Unit III:

- Letter writing in Sanskrit, Notice Writing in Sanskrit, Invitation writing in Sanskrit, Description of Festivals in Sanskrit.

Unit IV:

- Sloka Recitations, Numerical Counting in Sanskrit, Sanskrit Story telling, Self introduction in Sanskrit (Practical).

Core Readings:

- ✓ *Samskrta Vyakarana Darpana,*
- ✓ *Samskrta Vyakarana manjusa, Kamalesh Bhatia, Chaukhamba Sanskrit Pratisthan,* Delhi, 2022

Suggested Readings:

- ✓ *Samskrta jnananidhi, Dr. Ram Vilash Choudhuri and Dr. Dhruva Kumari Choudhuri, MLBD, Delhi, Reprint,2016*
- ✓ *A Higher Sanskrit Grammar, M. R. Kale, MLBD, Delhi, 2005*

AEC-3:Urdu

Credit-4

اردو مواصلات و مراسلات

URDU MOASLAT-O-MORASLAT

Credit: 4 **Full Mark: 100**

Course Outcomes:

1. To build up the Primary skill in students to use the langue effectively in public and work domain both.
2. To give students practice in writing responses and narration of a particular situation.

UNIT-I

معاشرہ اور زبان

1۔ زبان کی اہمیت و افادیت

2۔ مواصلاتی اردو

Learning Outcome: After completion of this unit the learner will be able to explain the relation between society and language and develop understanding about language utility and communicative Urdu.

UNIT-II

قواعد اور بندش الفاظ

1۔ متضاد الفاظ، مترادف الفاظ، ہم صوت الفاظ، سابقے لاحقے والے الفاظ اور عربی اور فارسی جمع الفاظ کی مشق

2۔ اضافتی، عطفی اور توصیفی مرکبات کے صحیح استعمال کی مشق

Learning Outcome: After completion of this unit the learner will be able to explain the basic grammar of language and its uses.

UNIT III

روزمرہ، محاورے اور ضرب الامثال

1۔ عربی و فارسی سے مستعار روزمرہ، محاورے اور ضرب الامثال کے استعمال کی مشق

2۔ دیسی روزمرہ، محاورے اور ضرب الامثال کے استعمال کی مشق

Learning Outcome: After completion of this unit the learner will be able to explain the uses of native and loan inputs of Urdu language

and develop skill of presentation and expression needed in the academic as well as professional domain.

UNITIV

تحریری مشق

1۔ تخلیص نگاری اور رپورٹ نگاری

2۔ تفہیم اقتباسات اور سوالات وجوابات

3۔ خطوط/درخواست نگاری

Learning Outcome: After completion of this unit the learner will be able to uses the language in different situation and develop communicative ability hence creating employability for them.

معاون کتب

1۔ اردو زبان و قواعد (حصہ اول ودوم)--- شفیع احمد صدیقی

2۔ اردو صرف--- محمد انصاراللہ

3۔ اردو نحو--- محمد انصاراللہ

4۔ اردو کی لسانی تشکیل--- مرزا خلیل احمد بیگ

5۔ اردو صرف و نحو--- مولوی عبدالحق

Model Questions

1۔ کسی لفظ کے ہم معنی الفاظ کیا کہلاتے ہیں؟	01
2۔ سابقے سے کیا سمجھتے ہیں ایک مثال سے واضح کیجیے۔	02
3۔ زبان کی اہمیت وافادیت پر ایک مختصر نوٹ لکھیے۔	05
4۔ اپنے والد کو خط لکھ کر انہیں اپنی تعلیمی سرگرمی سے باخبر کیجیے۔	08

VAC-1: Environmental Studies & Disaster Management
Credit-3

Unit I: Multidisciplinary nature of environmental studies (8 Period)

- Definition, scope and importance
- Need for public awareness
- Environmental Pollution
- Definition
- Cause, effects and control measures of:
    a) Air pollution
    b) Water pollution
    c) Soil pollution
    d) Marine pollution
    e) Noise pollution
    f) Radiation pollution

Unit II: Natural Resources: (8 Period)

Renewable and non-renewable resources:

Natural resources and associated problems.

a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.
b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
d) Food resources: World food problems, changes caused by agriculture and Over grazing, effects of modern agriculture, fertilizer-pesticide problems, Water logging, salinity, case studies.
e) Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies.

Biodiversity:

Introduction-Definition; Biogeographically classification of India
India as a mega diversity nation. Hot sports of biodiversity, Threats to biodiversity. Endangered and endemic species of India. Conservation of biodiversity. In Situ and Ex-so conservation of biodiversity

Unit-3: Disaster Management (8 Period)

1. **Disaster Management**: Types of disasters (natural and Man-made) and their causes and effect)

2. **Vulnerability Assessment and Risk analysis:** Vulnerability to various disasters (Flood, Cyclone, Earthquake, Heat waves, Desertification and Lighting)

3. **Institutional Framework:** Institutional arrangements for disaster management (National Disaster Management Authority (NDMA), State Disaster Management Authority (SDMA), Disaster Management Act, 2005, District Disaster Management Authority (DDMA), National Disaster Response Force (NDRF) and Odisha Disaster Rapid Action Force (ODRAF)

4. **Preparedness measures:** Disaster Management cycle, Early Warning System, Pre Disaster and Post-Disaster Preparedness, strengthening of SDMA and DDMA, Community Preparedness for flood cyclone, heat waves, fire safety, lightening and snake biting. Stake holders participation, Corporate Social Responsibility (CSR)

5. **Survival Skills:** Survival skills adopted during and after disaster (Flood, Fire, Earthquake, Cyclone and Lightening), Disaster Management Act-2005, Compensation and Insurance

Unit 4: Social Issues and the Environment (6 Period)

A.

a) Environmental Ethics: Issues and possible solutions.
b) Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies
c) Environment Protection Act
d) Air(Preservation Control of Pollution) Act
e) Water(Preservation Control of Pollution) Act
f) Wildlife Protection Act
g) Forest Conservation Act
h) Solid waste management Cause, effect and Control Measure of Urban and Industrial waste (Role of each individual in conservation of Natural resources and prevention of pollution)

B. Human Population and the Environment

Population Ecology: Individuals, species, population, community
Human population growth, population control method
Urbanisation and its effect on society

Unit 5: Field work (15 Periods of 30 hrs)

- Visit to an area to document environmental assets: river/forest/flora/fauna, etc.
- Visit to a local polluted site- Urban/Rural/Industrial/Agricultural
- Study of common plants, insects, birds and basic principles of identification.
- Study of simple ecosystems-pond, river, Delhi Ridge ,etc.

Semester-II
MAJOR-I-P1: Data Structures
Credit-4

Course Outcomes:

- To understand different ways of organizing data in computer's memory.
- To learn different operations on data structures.
- To explore different applications of data structures.

Learning Outcomes:

Upon completion of this course, students will be able to:

- Learn about data structures and the use of array
- Create linked lists and perform insertion/deletion operations on them
- Represent Stack and Queue in the memory and learn their applications
- Learn the use of various non-linear data structures and their applications

Unit I:

- Introduction to Data Structures: Definition, Concepts, Classification of Data Structures.

- Array: Introduction, One-Dimensional Array, Memory representation, Operations: Traversing, Searching, Insertion, Deletion, Merge. Two-Dimensional Array & Memory Representation, Multidimensional Array. Linear Search versus Binary Search, Sorting: Selection Sort, Bubble Sort.

Unit II:

- Linked Lists: Definition, Single Linked List, Memory representation, Operations: Traversing, Searching, Insertion, Deletion and Merge. Double Linked List, Operations: Insertions, Deletion.

- Circular, Double Circular Linked list, Operations: Traversing, Insertion. Applications of Linked List, Sparse Matrix and Polynomial representations.

Unit III:

- Stack: Definition, Representation: Array and Linked List representations, Operations: PUSH, POP, STATUS. Applications: Evaluation of Arithmetic Expressions: Notations, Infix to Postfix Conversion, Evaluation of Postfix expression. Recursion (Factorial and Fibonacci), Tower of Hanoi.

- Queues: Definition, Representation: Array and Linked List representations, Operations: Enqueue, Dequeue. Structures of Queue: Circular, Deque and Priority Queue. Applications of Queue

Unit IV:

- Trees: Definition, Terminologies, Binary Tree: Properties, Representations (Linear and Linked List representations). Operations: Traversal (Inorder, Preorder, Postorder), Search. Introduction to Binary Search Tree, AVL tree, M-Way Search Tree. Applications of Trees.

- Graph: Definition, Terminologies, Representations (Set, Linked List, Matrix), Operations: Traversal (BFS, DFS). Applications of Graphs.

Text Books:

- ✓ *Classic Data Structure, D. Samanta, PHI, 2/ed.*
- ✓ *Ellis Horowitz, Sartaj Sahni, "Fundamentals of Data Structures", Galgotia Pubs*.

Reference Book:

- ✓ *Sastry C.V., Nayak R, Ch. Rajaramesh, Data Structure & Algorithms, I. K. International, Publishing House Pvt. Ltd, New Delhi.*

BCA 3.1 Lab: Data Structures

Write C Programs for the followings:

1. To search an element and print the total occurrences in the array.
2. To insert and delete elements into/from appropriate position in an array.
3. To perform Binary Search.
4. To perform Bubble sort.
5. To perform Selection sort.
6. To implement linear linked list and perform operations such as traverse, search, insert, delete, and reversing the list.
7. To implement circular linked list and perform operations such as node insert and delete.
8. To implement double linked list and perform operations such as node insert and delete.
9. To represent a Sparse Matrix using linked list.
10. Polynomial representation using linked list.
11. Array and Linked list implementations of Stack and perform operations such as push, pop and status.
12. Linked list implementation of Queue and perform operations such as enqueue and dequeue.
13. Linked list implementation of Circular Queue.
14. To implement a Binary Search Tree.
15. To perform tree traversal operations.
16. To implement adjacency matrix for a given graph.
17. To perform BFS and DFS traversal.

MAJOR-I-P2: Object Oriented Programming using C++
Credit-4

Course Outcomes:
- To know about the Object-Oriented Programming concepts.
- To write object-oriented programs using C++ constructs

Learning Outcomes:
Upon completion of this course, students will be able to:
- Understand OOPs concepts as a programming style
- Use class/objects in programs and functions of different types
- Learn the concept of inheritance and overloading of functions and operators
- Use files in C++

Unit I:
- Principles of Object-Oriented Programming: Object-Oriented Programming (OOP) Paradigm, Basic Concepts of OOP, Benefits of OOP, Characteristics of OOPS, Object Oriented Languages, Applications of OOP.
- Introduction to C++, Difference between C & C++, Tokens, Data types, Operators, structure of C++Program, C++statements, Expressions and Control Structures.
- Functions in C++: Argument passing in function, Inline Functions, Default Arguments, Const. Arguments, Friend function.

Unit II:
- Classes and Objects: Defining Member Functions, Making an outside Function Inline, Nested Member Functions, Private Member Functions, Arrays within a Class, Memory Allocation for Objects, Static Data Members, Static Member Functions, Arrays of Objects, Objects as Function Arguments, Friend Functions.
- Constructors& Destructors: Constructors Parameterized Constructors, Constructors with Default Arguments, Dynamic Initialization of Objects, Copy Constructor, Dynamic Constructors, and Destructors.

Unit III:
- Inheritance: Basics of Inheritance, Type of Inheritance, Virtual Base Classes, Abstract Classes, Member Classes, Nesting of Classes. Polymorphism: Pointers, Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions, Pure Virtual Functions, Function Overloading, Operator Overloading.

Unit IV:
- Managing Console I/O Operations: C++Streams, C++ Stream Classes, Unformatted I/O Operations, Formatted Console I/O Operations, Managing Output with Manipulators.
- Files: Classes for File Stream Operations, Opening and Closing a File, Detecting end-of-file, File Modes, File Pointers and their Manipulations, Sequential Input and Output Operations, Updating a File: Random Access, Error Handling during File Operations, Command-line Arguments.

Text Books:
- ✓ *E. Balgurusawmy, Object Oriented Programming with C++, 4/e(TMH).*
- ✓ *Bjarne Stroustroup, Programming-Principles and Practice using C++, 2/e, Addison-Wesley*

Reference Books:
- ✓ *Paul Deitel, Harvey Deite, "C++: How to Program", 9/e , Prentice Hall.*
- ✓ *Herbtz Schildt, C++: The Complete reference, McGraw Hill.*

BCA 4.1 Lab: Object Oriented Programming using C++

1. Write a Program for Swapping of two numbers.
2. Write a Program to find sum of four numbers using default argument passing.
3. Write a Program to find square and cube of a number using inline function.
4. Write a Program to find the factorial of a number.
5. Write a Program to find reverse of a number.
6. Write a program to find sum of four numbers using default argument passing in member function.
7. Write a Program to find area of circle, triangle and rectangle using function overloading.
8. Write a program to distinguish the properties of static and non-static members.
9. Write a program to show the method of accessing static private member function.
10. Write a program to show the ways of calling constructors and destructors.
11. Write a program to perform ++ operator overloading using member function.
12. Write a program to perform ++ operator overloading using friend function.
13. Write a program to perform + operator overloading for two complex number addition.
14. Write a program to perform + operator overloading for string concatenation.
15. Write a program to perform single inheritance.
16. Write a program to perform multiple inheritances.
17. Write a program to create an integer array using new operator and find the sum and average of array elements.
18. Write a program to implement virtual destructor.
19. Create the Person class. Create some objects of this class (by taking information from the user). Inherit the class Person to create two classes Teacher and Student class. Maintain the respective information in the classes and create, display and delete objects of these two classes (Use Runtime Polymorphism).
20. Write a program to Copy the contents of one file to other.

MINOR-I-P1: Business Economics
Credit-4

Course Outcomes:

- To introduce the economic concepts.
- To familiarize with the students the importance of economic approaches in managerial decision making.
- To understand the applications of economic theories in business decisions.

Unit I:

- Demand, Supply and Market equilibrium: individual demand, market demand, individual supply, market supply, market equilibrium;
- Elasticity of demand and supply: Price elasticity of demand, income elasticity of demand, cross price elasticity of demand, elasticity of supply;
- Theory of consumer behaviour: cardinal utility theory, ordinal utility theory (indifference curves, budget line, consumer choice, price effect, substitution effect, income effect for normal, inferior and Geffen goods), revealed preference theory.

Unit II:

- Producer and optimal production choice: optimizing behaviour in short run (geometry of product curves, law of diminishing margin productivity, three stages of production), optimizing behaviour in long run. (isoquants, isocost line, optimal combination of resources)
- Costs and scale: traditional theory of cost (short run and long run, geometry of cot curves, envelope curves), modern theory of cost (short run and long run), economies of scale, economies of scope.

Unit III:

- Theory of firm and market organization: perfect competition (basic features, short run equilibrium of firm/industry, long run equilibrium of firm/industry, effect of changes in demand, cost and imposition of taxes); monopoly (basic features, short run equilibrium, long run equilibrium, effect of changes in demand, cost and imposition of taxes, comparison with perfect competition, welfare cost of monopoly), price discrimination, Multiplan monopoly; monopolistic competition (basic features, demand and cost, short run equilibrium, long run equilibrium, excess capacity); oligopoly (Cournot's model, kinked demand curve model, dominant price leadership model, prisoner's dilemma)

Unit IV:

- Factor market: demand for a factor by a firm under marginal productivity theory (perfect competition in the product market, monopoly in the product market), market demand for a factor, supply of labour, market supply of labour, factor market equilibrium.

Text Books:

- ✓ *Yogesh Maheswari, Managerial Economics, PHIL earning, New Delhi.*
- ✓ *G. S. Gupta, Managerial Economics, Tata Mc graw-Hill, New Delhi.*

Reference Books:

- ✓ *Moyer & Harris, Managerial Economics, Cengage Learning, New Delhi.*

MDC: Environmental Education (Education)
Credit-3

Course Outcomes:
On completion of the course, the students will be able to:

- Understand the natural environment, different cycles related to Ecology &Ecosystem.
- Identity different causes of Environmental Pollution, Climate Change and need for Sustainable Development.
- Acquire comprehensive knowledge about Population Ecology, population Growth and Public Health.
- Learn about Environmental Movements and Laws.
- Acquire the knowledge about State pollution Control Board and Central pollution Control Board.

Unit I: Introduction to Environment
Learning Outcomes

LO: *Understand basic concepts of Environment, Ecology, Eco-System and Biodiversity.*

- The Environment: Atmosphere, Hydrosphere, Lithosphere, Biosphere.
- Ecology, Ecosystem, major eco-system, Biogeochemical Cycle (Carbon Cycle, Nitrogen Cycle).
- Biodiversity-Values and Services, Global Environmental Issues.

Unit II: Climate Change and Sustainable Development
Learning Outcomes

LO: *Identify factors of pollution and climate change.*

LO: *Learn basics of wildlife conservation and Sustainable Development Goals.*

- Environment Pollution: Air Pollution, Water Pollution, Soil Pollution, Noise Pollution, Thermal Pollution, Radiation Pollution.
- Climate Change, causes and consequences, Natural Resources: Conservation of Natural Resources, Soil Erosion and Conservation.
- Management and Conservation of Wildlife, Sustainable Development and its Goals.

Unit III: Population and Public Health Learning Outcomes

LO: *Understand the correlation between population growth and issues of public health.*

LO: *Learn how to manage pandemic in modern times.*

- Population dividend and population liability.
- Population Ecology: Individuals, Species, role of different sector in managing health disaster.
- Population Growth and Control, Community, Urbanization and its effects on Society.
- Communicable Diseases, Non-Communicable Diseases, Transmission and its effects.

UnitIV: Environmental Movements and Environmental Laws
Learning Outcomes

LO: *Trace environmental movements of India.*

LO: *Understand functions and role of Pollution Control Boards and know the basic laws of India relating to environment.*

- Environmental Movements in India: Grass root Environmental movements in India, Role of women, Environmental Movements in Odisha.
- State Pollution Control Board, Central Pollution Control Board.
- Environmental Laws: Water Act,1974, Air Act,1981, The Wildlife (Protection) Act, 1972, Environment Protection Act 1986.

Sample Questions

1. What is meant by environment? (1 Mark)
2. Write any two causes of noise pollution. (2Marks, Within50 words)
3. Discuss the causes and consequences of climate change (5Marks, Within 300 words)
4. Critically reflection the importance and purpose of SDG switch reference to the contemporary society. (8 Marks, 500 to 800 words)

Transaction Mode:

Workshop, ICT-Lab Learning, Lecture method, Seminar, Team teaching, Tutoring, Peer group discussion, Mobile teaching, Self-learning, Collaborative learning, Co-operative learning.

Practical/Activities

Each student is required to submit Practical/Project report/Assignments selecting any one of the following:

1. Investigation of Major sources of micro-plastic pollutants in urban habitats.
2. Detection and characterization of major water pollutants in river water.
3. Impact of growing urbanization on wildlife habitat.

* It will be evaluated by both internal and external examiners.

Text Books

- ✓ *Anubha Kaushik and CP Kaushik, "Perspectives in Environmental Studies", 5th edition, 2016.*
- ✓ *Benny Joseph, "Environmental studies", 2nd edition, McGraw Hill Education, 2015.*
- ✓ *Basics of Environmental Studies by Dr. N.S. Varandani, Books India Publications.*
- ✓ *Disaster Management by Mukesh Dhunna, Vayu Education of India, Delhi Publication.*

Reference Books

- ✓ *Dr. M. Chandrasekhar, "A Textbook of Environmental Studies", HI-TECH publications, 2006.*
- ✓ *Dr. M. Anji Reddy, "A Textbook of environmental science and Technology", BS Publications, 2008.*
- ✓ *Dr. K. Mukkanti, "A Text book of Environmental Studies", S. CHAND and Company Ltd, 2009.*
- ✓ *EHILR Sand ST, "Text book of Municipal and Rural Sanitation", M.S Hill, 1998.*
- ✓ *C. S. Rao, Wiley Eastern Ltd, "Environmental Pollution Control Engineering", New Age International Ltd, 2001.*
- ✓ *Dr. M. Anji Reddy, "Introduction to Remote Sensing", BS Publications,2004.*
- ✓ *EHILR Sand ST, "Text book of Municipal and Rural Sanitation", M.S Hill, 1998.*
- ✓ *Dr. M. Anji Reddy, "Introduction to Remote Sensing", BS Publications, 2004.*
- ✓ *Environmental Studies by R. Rajagopalan, Oxford University Press Publication.*
- ✓ *Environmental Science by Richard T Wright & Bernard J Nebel, Prentice Hall India Publication.*
- ✓ *Environmental Science by Daniel B Botkin &Edward A Keller, Wiley Publications.*

AEC: English

Credit-4

Introduction

This Course aims at providing students familiarity with all components of language learning; listening, speaking, reading, writing, grammar and vocabulary which will eventually help in development of communication skills. This is an activity-based, goal-oriented, functional course, which aims to make the students able and efficient communicators by helping them to be self-reflexive about English. This course has a predefined context of being supportive and complementary to the core courses in various disciplines. Therefore, unlike most other courses in English Communication on offer, it does not seek to build facile fluency that passes off as communicative competence. Rather, it intends to equip the students with the relevant skills of presentation and expression needed in the academic as well as in the professional domains. While reading skills exercises are meant to promote the acquisition of analytical and comprehension skills, writing skills exercises are centred on sentence construction, paragraph development and précis writing. In this course there is ample scope to build the speaking and listening skills of students with an emphasis on interactive learning and articulation.

Course Objectives

- Develop in students the required knowledge, skills, and judgment around human communication that facilitate their ability to work collaboratively with others.
- Enable the students to understand and practice different techniques of communication. Through this course, they will familiarize themselves with different types of communication. Enhance the employability of students by developing in them the required skills of communication in English, so as to enable them to: i. Speak correctly, intelligibly and fluently as well as to listen and comprehend accurately when spoken to, so as to be able to communicate effectively and with confidence in a variety of social, academic and work-related situations; ii. Read and comprehend accurately the various kinds of written texts which they may be expected to deal with; iii. Write effectively in a number of different genres (forms) of writing, relevant to social, academic and work-related needs;
- Develop interpersonal skills and the attitudes required for effective functioning in different social and work-related situations.
- Provide cognitive and cultural enrichment through exposure to a variety of humanistic learning experiences. General Pedagogical Principles 1. Instruction will essentially be activity-based. Each session will provide a variety and range of activities, pitched at different levels of linguistic competence. Group activities will be encouraged. The links between theory and practice will constantly be exemplified and highlighted. Theoretical inputs will be provided, as far as possible, in a non-technical manner. 2. Periodical tests may be conducted to assess skills and application of theoretical principles and not recalling information from memory. The skills of Listening and Speaking may be tested through oral examinations in the classes, depending on time and scope. 3. An inventory of available software, including audio/ audio-visual materials should be made, and the use of such materials be standardised across all colleges. If necessary, software tailored to the requirements of the program should be produced in collaboration with appropriate agencies. 4. Although portions of selected texts will be used to develop the skills, a teacher is free to use material recommended by the experts. 5. The course cannot be effectively implemented unless all instructors are properly oriented. It should be ensured that orientation programs are organised before the curriculum is implemented. Handbooks must be produced and made available to all instructors. 3 6. Workshops for the development of instructional materials by members of college faculties

should be organised periodically, as a part of on-going orientation.

Attention

The course drives away the myth that communicative competence in a language is honed, built and effectively practiced by learning and mastering the grammar, phonetics of a language or appropriating the accent and structures of the native tongue. Rather it is an adaptation with equal blend of the first language and the context in collaboration with the foreign tongue achieved by suitable use of texts from literature. So the teachers as well as students are advised to use as much literary texts as possible from the texts prescribed and other sources for providing an exposure to the students to be aware of the truth that literature enables skillful communication. The examination questions will be set according to the texts and topics prescribed.

Unit I: English Language and Communication: Introduction (9 hours)

- i. Communication, its importance and factors that determine communication (sender, receiver, channel, code, topic, message, context, feedback, barriers) models of communication, the information gap principle: given and new information; information overload, redundancy and cliches, the importance of audience and purpose ii. Types of communication: horizontal, vertical, interpersonal, lateral and grapevine iii. Verbal and nonverbal communication, body language and its manifestations in different cultures, written and oral communication, bias-free communication, political correctness. iv. Styles of Communication: formal, informal and semi formal Note: The topics listed above should be introduced briefly in the theory classes. The reflections of the students' understanding may be assessed by the facilitator through exercises. The teacher/facilitator can refer to the books recommended under 'prescribed readings' for teaching and exercise purposes. He/she can refer to valid and recognised web-resources and additional titles from renowned publishing houses for the same purpose.

Texts

- ✓ *Communicative English OSHEC Publication. Chapters: Unit-I*
- ✓ *Literature and Art of Communication by Asima Ranjan Parhi, Madhusmita Pati, Subhra Prakash Das and Shakina Mohol, Cambridge University Press, 2019.*
- ✓ *The International Encyclopedia of Communication. Malden, MA: Blackwell Publishing. (e-book) 4*

Suggested Readings

- ✓ *A Cognitive Approach to Language Learning. Oxford University Press Donsbach, Wolfgang. (2008).*
- ✓ *'Prospect of Electronic Media as Curriculum in Non-Native Contexts', by Parhi and Dutta in I-Manager's Journal on English Language Teaching, 4(2)2014. https://files.eric.ed.gov. pdf*
- ✓ *21st Century Communication: A Reference Handbook. Thousand Oaks, Calif: SAGE Reference. (e-book)*
- ✓ *Written and Spoken Communication in English published by Orient Blackswan*
- ✓ *Indian English through Newspapers, A R Parhi, Concept, New Delhi, 2008.*
- ✓ *An Introduction to Professional English and Soft Skills by Das et al*
- ✓ *Communicative Competence. T T Panigrahi, Notion Press, India, Singapore and Malaysia*
- ✓ *Soft Skills for Your Career, by Kalyani Samantaray. OUP*
- ✓ *An Anthology of English Prose 1400–1900 Cambridge University Press 2015.*

Unit II: English Language and Communication: Listening and Speaking (9 hours)

- i. Types of listening (active and passive), listening to respond (how, when and why), empathic listening and interactive listening ii. Speaking to communicate effectively: fluency, accuracy. intelligibility and clarity iii. Style of speaking in various situations: formal, informal and semi-formal, tentative and cautionary, simple and plain English iv. English pronunciation: vowel and consonant sounds, diphthong, IPA, syllable division and primary stress in words, stress shift, sentence rhythm and weak forms, contrastive stress in sentences, intonation: falling and rising tones, varieties of spoken Englishes: Standard Indian, American and British (R.P.); 'Neutral English', newspapers, ad captions and their contribution to the shaping of Indian English as a standard language

Note: This unit does not go deep into phonetics. The objective is to train students to refer to a Learners' Dictionary to find out the correct pronunciation of words. Students will be introduced to phonemic transcription using IPA symbols in theory classes and further practice will be provided during exercises/practices. The teacher/facilitator will include simple questions on phonemic transcription and the marking of stress in words and sentences. The teacher/facilitator can refer to the books recommended under both 'Texts' and 'Suggested Readings' for teaching and exercise purposes. He/she can refer to valid and recognised web resources and additional titles from renowned publishing houses for the same purpose.

Texts

- ✓ *Communicative English OSHEC publication. Chapter-Unit I*
- ✓ *The Sound of English by www.pronunciationstudio.com*
- ✓ *'Towards the Anti-Canon: A Brief Focus on Newspaper English in India', SHSS (Studies in Humanities and Social Sciences, UGC Care), Ed. T.R. Sharma, IIAS (Indian Institute of Advanced Study), Shimla, Vol. XIII, No.1, Summer 2006, pp.143-155. http://14.139.58.200, iias.ac.in.journalsAsimaRanjanParhi.*

Suggested Readings

- ✓ *The Sounds of English Around the World: An Introduction to Phonetics and Phonology Cambridge University Press*
- ✓ *"Listening in the Language Classroom", pp. 58 - 76 DOI: https://doi.org/10.1017/CBO9780511575945.006, Cambridge University Press, Print publication year: 2009*
- ✓ *An Introduction to Professional English and Soft Skills by Das et al.*
- ✓ *Teaching the Spoken Language. Cambridge University Press Speaking. Oxford University Press*
- ✓ *Communicative Competence. Notion Press, India, Singapore and Malaysia*
- ✓ *Exploring Spoken English. Cambridge University Press English Conversation. Oxford University Press*
- ✓ *The English Language in India: From Racial-Colonial to Democratic", EJBS (The European Journal of Behavioral Sciences) 3 (1): page:8-16, Dec. 2020. DOI-10.33422/ejbs.v3i1.302*

Unit III: English Language and Communication: Reading and Writing (9 hours)

- i. Reading methods and techniques: fluency, accessing meaning, levels of competence, skimming and scanning, global and local reading, silent reading and reading aloud ii. Reading texts to understand literal, metaphorical and suggested meanings (essays, poems and stories), identifying the tone (admiring, accusatory, ironical, sympathetic, ambiguous and

neutral etc.) of the writer iii. Writing process: brainstorming, pre-writing, writing and post writing, coherence, cohesion, style, iv. Writing short texts: paragraph writing; writing longer texts: literary writing, academic writing and media writing

Note: This unit will focus on the basic principles of reading and writing as forms of communication. The teacher/facilitator may use reading material from literary texts, media writings, non-fiction prose and other written discourses. He/she needs to adopt caution in selecting the reading materials. Reading and writing are related activities. The insights gained through training in reading can be utilised for effective writing. The teacher/facilitator must refer to the chapters and topics from the books recommended under 'Prescribed Texts' for teaching and exercise purposes. From which questions will be set for the examination. He/she can refer to valid and recognised web-resources and additional titles from renowned publishing houses for the same purpose.

Prescribed Pieces/Texts

- ✓ *Communicative English OSHEC Publication. Chapters: Unit-III*
- ✓ *From The Winged Word, David Greene, Macmillan. 1974 and Melodious Songs and Memorable Tales, 2015:*
- ✓ *'Daffodils' by William Wordsworth, 'When we two Parted' by Lord Byron, 'The Last Ride Together' by Robert Browning, "Self Portrait" by A K Ramanujan.*
- ✓ *From The Widening Arc. Kitab Bhavan, 2016, A R Parhi, S Deepika, P Jani.*
- ✓ *'No Learning without Feeling' by Claire Needell Hollander and 'The Empty Page' by Steven Harvey, 'George V High School' by Dinanath Pathy*

Suggested Readings

- ✓ *The Oxford Essential Guide to Writing Oxford University Press 2000.*
- ✓ *An Introduction to Professional English and Soft Skills Das et al*
- ✓ *The Classic Guide to Better Writing: Step-by-Step Techniques and Exercises to Write Simply, Clearly and Correctly Oxford University Press, 1996*
- ✓ *Ways of Reading: Advanced Reading Skills for Students of Literature Routledge. 2007.*
- ✓ *'Semantic Excess or New Canons? Exploring the Print Media', Journal of Media and Communication, 2010. Research Gate https://www.researchgate.net.237. A R Parhi*
- ✓ *An Anthology of English Prose 1400–1900Cambridge University Press 2015*

Unit IV: English Language and Communication: Grammar and Vocabulary (9hours)

- i. Grammar for meaning, multiplicity of meaning, grammar in communication ii. Stative and dynamic verbs, modals and auxiliaries, tense and time reference, aspect, voice, modality, negation, interrogation; reported questions and tag questions, complex noun phrases, concord phrasal verbs. iii. Sentence structure: simple, compound and complex, clauses, types of sentences: statement, questions, exclamations, commands iv. Functions of language, usage-oriented vocabulary, neutral vocabulary Note: The teaching of grammar and vocabulary in this unit need to be connected to communication teaching. Teachers/Instructors may select other areas of grammar for review depending on the needs. They will identify the grammatical errors commonly made by their students in speech as well as writing. The remediation of these errors may require some explanations of grammar. Instructors should use many grammar and vocabulary related exercises and through them will provide all the grammatical information needed to explain the errors that are identified. The teacher/facilitator can refer to the books recommended under 'suggested readings' for teaching and exercise purposes. He/she can refer to valid and recognised web-resources and additional titles from renowned publishing houses for the same purpose.

Texts

- ✓ *Communicative English OSHEC publication. Chapters: Unit-III Communicative Grammar of English by Geoffrey Leech. Rout ledge publications, 2002*
- ✓ *Oxford Practical English Usage (International Edition 2016) by Michael Swan*

Suggested Readings

- ✓ *The Widening Arc, Kitab Bhavan, Asima R Parhi, S Deepika, P Jani, 2016.*
- ✓ *Writing Skills Remapping: An Anthology for Degree Classes Orient Blackswan*
- ✓ *An Anthology of English Prose 1400–1900 Cambridge University Press 2015*

Scheme of Evaluation:

Midterm test: 20 marks

5x1=5 (short answer, short notes, comprehension questions)
5x1=5 (Analytical, perspective-based and critical-analysis questions)
5x2=10 (activity/practice/reports/case studies/response papers/assignments etc.)

The teacher will have the flexibility of conducting internal examinations or assess the students' learning outcomes through activities, short projects, case studies etc. from all 20 marks/ in parts

Final Examination: 80 marks

Unit I: 1 long answer question + 1 short note/analysis (15+05) = 20 marks
Unit II: 1 long answer question + 1 short note/analysis (15+05) = 20 marks
Unit III: 1 long answer question + 1 short note/analysis (15+05) = 20 marks
Unit IV: 1 long answer question + 1 short note/analysis (15+05) = 20 marks

SEC: Analytical Ability and Reasoning
Credit-3

Course Objectives

- To cover various forms of reasoning including deductive, inductive, and abductive, and integrate these with critical thinking skills.
- To explore logical sequences, coding-decoding, and arrangements as key elements of logical reasoning.
- To delve into complex logical reasoning constructs such as alphanumeric series, reasoning analogies, and calendars.
- To engage with arguments involving two or more premises and utilize connectives effectively.

Learning Outcomes

- To be acquainted with using facts, evidence, rules, and principles to draw valid conclusions and make sound judgments
- Able to practice pattern recognition, spatial reasoning, and decision-making as fundamental components of analytical reasoning
- Able to apply logical reasoning to practical scenarios involving cause and effect, dices, directions, and visual reasoning
- Able to master logical constructs such as statements and assumptions, conclusions, and syllogisms

Unit I: Analytical Reasoning

- Deductive Reasoning, Inductive Reasoning, Abductive Reasoning, Critical Thinking, Pattern Recognition- Data, Sequences, Structures, Logical Reasoning, Spatial Reasoning, Causal Reasoning, Decision Making.

Unit II: Basic Logical Reasoning Concepts

- Logical Sequence Series- patterns and sequences in reasoning. Coding- Coding decoding. Arrangements-Seating arrangements and data arrangement. Blood Relations-problems related to blood relations. Input and Output Patterns. Binary Logic Problems

Unit III: Logical Reasoning

- Alphanumeric series, Reasoning Analogies, Calendars, Cause and Effect, Clocks, Cubes and cuboids, Data Sufficiency, Decision Making, Deductive Reasoning/Statement Analysis, Dices, Directions, Mirror and Water Images,

Unit IV: Logical Statements

- Two premise argument. More than two premise argument using connectives. Statement and Assumptions. Statement and Conclusions. Syllogism.