7. BCA Semester - IV Syllabus

BCA Semester – IV (Second Year)

Subject Title : **Python Programming**
Subject Code : **CAM208-2C**
Subject Type : **Major**

Rationale:

Python has become a widely popular programming language due to its versatility, user-friendliness, and extensive applications across various fields. This syllabus is designed to equip learners with a comprehensive understanding of Python programming, from its foundational concepts to advanced applications.

Learning Outcomes:

The Students will be able to:
- The basic principles of the Python Language.
- Use the tools to do simple programs in python.
- Create programs in Python programming language.
- Develop programs in Python using lists, tuples and strings.
- Prepare programs implementing file and function in Python.
- Implement Object Oriented concept in Python programming.
- Implement database programming in Python.

Teaching and Evaluation Scheme:

Credits	Duration in Hours		Maximum Marks		Total
	Theory	Practical	CCE (Formative)	SEE (Summative)	
4	30	60	50	50	100

Course Content:

Unit I **[Weightage=25% approx., Lectures=7, Practicals= 14]**
Introduction to Python: Python Features, Structure of a Python Program, Elements of Python, Python Interpreter, Python shell, Indentation, Strongly Typed features, Basic data types, Variables, Expressions, Statements, Flow of Execution, Input and Output Statements, Atoms, Identifiers and Keywords, Literals, Strings.
Operators: Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator.
Control Statements: IF, IF...ELSE, IF...ELIF..ELSE, MATCH...CASE. **Loop Controls:** WHILE Loop, FOR Loop, Range function, break, continue and pass statement with loop.

Unit II   [Weightage=25% approx., Lectures=7, Practicals= 14]
Control statements and Data Structures:

Lists: append, extend, insert, index, remove, pop, count, sort, reverse, slicing, Copying a list deep copy, shallow copy.

Tuples: tuples, index, count, max, min, len.

Dictionaries: keys, values, nested dictionaries, dictionary comprehension, clear, copy, get, items, keys, pop, popitem.

Strings: single line and multi-line strings, formatter, isdigit, isalpha, isalnum, islower, isupper, isspace, title, lower, upper, strip, split, splitlines join. Sets Union, Intersection, Subset, Superset, Difference, Symmetric Difference, Copy, Add, Remove, Discard.

Unit III   [Weightage=25% approx., Lectures=8, Practicals= 16]
Functions & File Handling:

Functions: Defining and calling functions, arguments, return, global versus local variables, defining and using lambda functions. map(),filter(), reduce() functions.

File handling: read, write and append modes: r, w, a, r+, w+, a+, reading-read(), readline(), readlines(), writing-write(), writelines(), seek(), tell(). Word count, copy file scripts through file handling concepts.

Unit IV   [Weightage=25% approx., Lectures=8, Practicals= 16]
Classes, Exceptional Handling & Libraries:

Classes and Exception Handling: Introduction, Member variables and defining Methods, Constructor, Destructor, Data Encapsulation, Inheritance. The Try-except-else-finally block, the raise statement, the hierarchy of exceptions, adding exceptions.

Libraries: Installing and Importing Libraries (Pandas, Numpy, Matplotlib).

Text Book:
- Dr. R. Nageswara Rao, Core Python Programming, First Edition,2017,Dreamtech Publishers.

Reference Books:
- Allen Downey, Jeffrey Elkner, Chris Meyers, How to think like a computer scientist : learning with Python , Freely available online.2012.
- Beginning Python: Using Python 2.6 & Python 3.1; James Payne; Wiley India; 2011.
- Maureen Sprankle, Problem solving and Programming Concepts, Pearson Education, New Delhi.

Reference Links:
- http://docs.python.org/3/tutorial/index.html
- http://interactivepython.org/courselib/static/pythonds
- http://www.ibiblio.org/g2swap/byteofpython/read/
- http://greenteapress.com/wp/think-python-2e/

Practical List:

- Write a program to print any string and numbers.
- Write a program of variable comparisons using comparison operators.
- Write a program to show concept of IF, IF...ELSE, IF...ELIF...ELSE control statements.
- Write a program to show concept of FOR, WHILE loop.
- Write a program to show concept of range() function with for loop
- Write a program by creating list to append element in list, insert element at specific index, remove first occurrence of a specific element and to pop an element from specific index.
- Write a program by creating list to sort, to reverse and to slice the list.
- Write a program by creating tuple to find count, min and max functions from tuple.
- Write a program to create dictionary and nested dictionary in python.
- Write a program by creating dictionary to evaluate clear, copy, get, items, keys, pop, popitem functions.
- Write a program to make any string in upper case, lower case, to split a string and to join a string.
- Write a program to check the value in variable using isdigit, isalpha, isalnum, islower, isupper, isspace functions.
- Write a program to define and call functions with argument and return value to find even odd number.
- Write a program to define and call functions with argument and return value to find prime number.
- Write a program to create a file and write in it with w and a options.
- Write a program to read data from a file.
- Write a program to create dictionary and nested dictionary in python.
- Write a Python Program to create a class, object and accessing class methods using object in a Python.
- Install Pandas Library and import in with and example Program.
- Install Numpy Library and import in with and example Program.
- Install Matplotlib Library and import in with and example Program.

BCA Semester – IV (Second Year)

Subject Title : **Web Design and Development**
Subject Code : **CAM209-2C**
Subject Type : **Major**

Rationale:

PHP is a powerful tool for making dynamic and interactive database driven web pages. PHP is the widely-used as efficient open source technology.

Learning Outcomes:

The Students will be able to:
- To understand the concepts, structure and design of PHP.
- To understand the Looping and Control structure of PHP.
- To understand the knowledge of user defined function and different form of array.
- To understand the flow of data between the pages and how to access the value of different form Elements.
- To understand different way to store the user data by the server.
- To understand MySQL database Outcome.

Teaching and Evaluation Scheme:

Credits	Duration in Hours		Maximum Marks		Total
	Theory	Practical	CCE (Formative)	SEE (Summative)	
4	30	60	50	50	100

Course Content:

Unit I [Weightage=25% approx., Lectures=7, Practicals= 14]
Introduction to PHP: PHP for Web Development, History and future scope of PHP, Relationship between PHP, MySQL, and Apache, Structure and Syntax of PHP, PHP variable and its data types, Type casting and Garbage value, Control Statements, If Statement, If...Else Statement, Nested If... Statement, Switch Statement. Looping Statements- For Loop, While Loop, Do...While Loop, For each Loop.

Unit II   **[Weightage=25% approx., Lectures=7, Practicals= 14]**

Array: Types of Array: Numeric array and associated array, Multi-dimensional Arrays.

User Define Functions: Types of Function, Return statement, How to call a function, Function without parameters, Function with parameters, default argument function, variable length argument function. Static Variable, Global Variable, Difference between Call by Value and Call by Reference.

Built-in Function: String functions, Math functions, Array functions.

Unit III   **[Weightage=25% approx., Lectures=8, Practicals= 16]**

Form Handling: Overview of HTTP methods: GET and POST, Understanding when to use GET or POST in form submissions. Form Validation, Server-side validation with PHP.

Variable Function: gettype, settype, isset, strval, floatval, intval, print_r.

String Function: Chr, ord, strtolower, strtoupper, strlen, ltrim, rtrim, trim, substr, strcmp, strcasecmp, strpos, strrpos, stristr, str_replace, strrev, echo, print.

Math Functions: abs, ceil, floor, round, fmod, min, max, pow, sqrt, rand.

Date Function: Date, getdate, setdate, checkdate, time, mktime.

Super-Global Variable: $_GET,$_POST,$_REQUEST, $_SESSION, isset(), isempty().

Unit IV   **[Weightage=25% approx., Lectures=8, Practicals=16]**

Cookies: Create, fetch, and delete cookies, Differentiate Session and Cookie, Steps to Connect with Database using PHP and MySQL, Concepts and Installation of MySQL, MySQL structure and syntax, Types of MySQL tables and Storage, Engines, MySQLi commands, Integration of PHP with MySQL, Connection to the MySQL Database, Creating and Deleting MySQL database using PHP, Updating, Inserting, Deleting records in the MySQL database.

Text Book:
- Beginning PHP and MySQL, 4th Edition , W. Jason Gilmore Apress, 2010, Publisher : Dreamtech Press; Fourth edition .

Reference Books:
- Teach yourself PHP, MySQL and Apache All in One , 5th Edition , Julie C. Meloni, Pearson.
- Learning PHP, MySQL, JavaScript, CSS & HTML5,Third Edition, Robin Nixon, O'reilly Media ,2014.

Reference Links:
- http://www.codecademy.com/tracks/web
- http://www.codecademy.com/tracks/php
- http://www.w3schools.com/PHP
- http://www.tutorialpoint.com

Practical List:

- Programs for demonstrating a program to display a Welcome message.
- Programs for demonstrating a program to perform arithmetic operations, use comparison operators, and logical operators.
- Programs for demonstrating a program to print the Fibonacci series.
- Programs for demonstrating a program to generate a result and display a grade.
- Programs for demonstrating a program to find the maximum number out of three given numbers.
- Programs for demonstrating a program for the addition of two 2x2 matrices.
- Programs for demonstrating a program to use Variable functions.
- Programs for demonstrating a program to obtain 5! Using a function.
- Programs for demonstrating a program to use string functions.
- Programs for demonstrating a program to use Date functions.
- Programs for demonstrating a program to use Math functions.
- Programs for demonstrating a program to use Array functions.
- Programs for demonstrating a program to use File functions.
- Programs for demonstrating a student registration form using text box, check box, radio button, select, submit button. Display user-inserted values on a new PHP page.
- Programs for demonstrating two different PHP scripts to pass variables through a URL.
- Programs for demonstrating two different PHP scripts to pass variables with sessions.
- Programs for demonstrating a PHP script to pass variables with cookies.
- Write a Practical PHP script to connect to the MySQL server from your website.
- Write a program to read customer information (cust_no, cust_name, Item_purchase, mob_no) from the customer table and display it in table format.
- Write a program to edit the name of the customer to "Bob" with cust_no = 1 and delete the record with cust_no = 3.
- Write a program to read employee information (emp_no, emp_name, designation, salary) from the EMP table and display it using table format.
- Write a Practical for a dynamic website using PHP and MySQLi.

BCA Semester – IV (Second Year)

Subject Title : **Operating System**
Subject Code : **CAM210-2C**
Subject Type : **Major**

Rationale:

Operating System and Programming provides the concept of operating system and its different components like process management, memory management, file management, device management.

Learning Outcomes:

The students will be able to:

- Know about Operating System, how it works, role of Operating System, different types of Operating System.
- Understand different components of Operating System like Process Management, Memory Management, File Management, Device Management, etc.
- Understand the Concept of Deadlock.
- Understand the Concept of CPU Scheduling.
- Understand Linux Basic and Advanced Commands and its structure.
- Understand concept of Shell Scripting, loops and Conditional Statements.

Teaching and Evaluation Scheme:

Credits	Duration in Hours		Maximum Marks		Total
	Theory	Practical	CCE (Formative)	SEE (Summative)	
4	30	60	50	50	100

Course Content:

Unit I [Weightage=25% approx., Lectures=15]

Operating System: Definition and Meaning of Operating System, Operating System Services.
Process Management: Introduction, Process States (Process Life Cycle), Process Control Block (PCB), Process Scheduling Queue: Job Queue, Ready Queue and Device Queue.
Schedulers: Long-term schedulers, Medium-term schedulers, Short-term schedulers, Context, Switch.
Scheduling Criteria: CPU Utilization, Throughput, Turnaround time, Response time, Waiting Time.
Process Scheduling Algorithms: First Come First Served (FCFS), Shortest Job First Scheduling (SJF), Round-Robin (RR), Priority.

Unit II   [Weightage=25% approx., Lectures=15]

Deadlock : Preemptable - Non Preemptable Resources, Deadlock, Resource Allocation Graph, Deadlock Conditions, Deadlock Detection, Deadlock Recovery.

File Management: File Concept, Directory Structure, File Allocation Methods.

Memory Management: Logical and Physical address space, Swapping, Contiguous memory allocation–Single process monitor, Multiprogramming with fixed partitions, Multiprogramming with dynamic partitions, Noncontiguous memory allocation methods-Paging, Segmentation.

Device Management: Overview, Disk Structure, Disk Scheduling algorithms: FCFS, SSTF, SCAN, LOOK, C-SCAN, C-LOOK.

Unit III   [Weightage=25% approx., Practicals=30]

Linux Command Introduction: Locating commands, Internal and external commands, Command structure.

Linux Basic commands: mkdir, rmdir, rm, cp, mv, ls, cal, date, cat, cd, find, head, tail, ps, touch, sh, who, chmod, pwd, echo.

Linux Advanced commands:

Finding Patterns in Files (grep, egrep, fgrep, look).

Counting Lines, Words and File Size (wc, nl).

Working with Columns and Fields (cut, paste, colrm, join).

Sorting the Contents of Files (sort, uniq).

Comparing Files (cmp, comm., diff, patch).

Changing Information in files (tr).

Performing Mathematical Calculations (bc, dc).

Unit IV   [Weightage=25% approx., Practicals=30]

Basic Shell Script: What is shell script, How to create a shell script, how to read number, how to assign numbers, how to perform arithmetic operations, Putting Comments in Shell Scripts, AND (&&) and OR (||) operators.

Loops: Writing loops, for loop, while loop, until loop, break and continue.

Conditional Statements: if else, else if ladder, nested if statements.

Command line arguments: Positional Parameters.

Text Books:

- "Operating System Concepts", Edition: Ninth Edition, Authors: Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, Publication: WILEY).
- "LINUX", Edition: First Edition, Authors: Kiran Gurbani, Publication: Himalaya Publishing House.

Reference Books:

- "Modern Operating System", Edition: Fourth Edition, Authors: Andrew S. Tanennbaum, HerBert Bos, Publication: PEARSON.
- "Operating Systems", Edition: Seventh Edition, Authors William Stallings, Publication: Prentice Hall.
- "UNIX : Concepts and Applications" , Edition : Fourth Edition, Author : Sumitabha Das, Publication: Mc Graw Hill Education.

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Reference Links:

- https://www.geeksforgeeks.org/what-is-an-operating-system
- https://www.tutorialspoint.com/operating_system/os_overview.htm
- https://www.javatpoint.com/operating-system
- https://www.geeksforgeeks.org/basic-linux-commands/

Practical List:

- Implement Following Linux Basic commands: mkdir, rmdir, rm, cp, mv, ls, cal, date, cat, cd, find, head, tail, ps, touch, sh, who, chmod, pwd, echo.
- Create two files named f1 and f2, add 10 lines in both files and perform following operations :
  - Finding Patterns in Files(grep, egrep, fgrep, look).
  - Counting Lines, Words and File Size(wc, nl).
  - Working with Columns and Fields(cut, paste, colrm, join).
- Create two files named f3 and f4, add 10 lines in both files and perform following operations :
  - Sorting the Contents of Files (sort, uniq).
  - Comparing Files (cmp, comm, diff, patch).
  - Changing Information in files (tr).
  - Performing Mathematical Calculations (bc, dc).
- Write a shell script to print "Hello World".
- Write a shell script to find the addition, subtraction, division, and multiplication of two given numbers.
- Write the following shell script using if-else statements:
  - Write a shell script to check that given number is even or odd.
  - Write a shell script to check that given year is leap year or not.
  - Write a shell script to find the percentage and also find the class.
    (if percentage>=70 then distinction, percentage>=60 then first class, percentage>=50 then second class, percentage>=35 then pass class else fail)
  - Write a shell script to find the greatest number from three given number.
- Write the following shell scripts using while, for and until loop:
  - Write a shell script to display 1 to 10 numbers.
  - Write a shell script to display 10 to 1 numbers.
  - Write a shell script to display 1 to n numbers.
  - Write a shell script to display n to 1 numbers.
  - Write a shell script to find the sum of 1 to 10 numbers.
  - Write a shell script to find the sum of 1 to n numbers.
  - Write a shell script to find the factorial of given number.
  - Write a shell script to display the multiplication table of given number.
  - Write a shell script to display the multiplication table of 1 to n no.

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BCA Semester – IV (Second Year)

Subject Title : **Data Communication and Network**
Subject Code : **CAE203-2C**
Subject Type : **Minor**

Rationale:

The objective of the course is to equip the students with a general overview of the concepts and fundamentals of computer networks. Familiarize the students with the standard models for the layered approach to communication between machines in a network and the protocols of the various layers.

Learning Outcomes:

The Students will be able to:
- Understand the basics of data communication.
- Differentiate between various types of computer networks and their topologies.
- Understand the difference between the OSI and TCP/IP protocol suit.
- Explain merits and demerits of different types of communication media.
- Distinguish between different types of network devices and their functions.
- Use IP addressing and understand the need of various application layer protocols.
- Understand the network design and various security concepts of network.

Teaching and Evaluation Scheme:

Credits	Duration in Hours		Maximum Marks		Total
	Theory	Practical	CCE (Formative)	SEE (Summative)	
4	60	-	50	50	100

Course Content:

Unit I   **[Weightage=25% approx., Lectures=15]**

Analog and Digital Signals: understanding analog and digital signals, periodic analog signals, digital signals, attenuation, distortion, bandwidth, throughput, latency.

Signal Conversion and Transmission Modes: Digital to digital conversion, analog to digital conversion.

Transmission modes: Simplex, Half-duplex, Full-duplex.

Digital Modulation Techniques: Digital to analog conversion: ASK, PSK, FSK, analog to analog conversion: AM, FM, PM.

Error Detection and Correction: Error, Types of Error: Single Bit Error, Multiple-Bit Error, Burst Error.

Error Detection Methods: Simple Parity Check, Two-dimensional Parity Check, Checksum, Cyclic Redundancy Check (CRC).

Error Correction: Hamming code.

Unit II [Weightage=25% approx., Lectures=15]
Introduction to Networking: Definition and importance, requirements of networking,
Entities in networking: sender, receiver, carrier.
Network elements: host, workstation, server.
Types of networks: LAN, WAN, MAN, PAN.
Physical topologies: bus, star, ring, mesh.

Unit III [Weightage=25% approx., Lectures=15]
OSI Model and TCP/IP Protocol Suite: Overview of the OSI model and its layers, TCP/IP
protocol suite and addressing schemes, Connection oriented v/s Connectionless approach.
Guided Media: Twisted pair cable, Coaxial cable, Fiber optics cable (for all structure,
advantages, disadvantages).
Unguided Media: Radio waves, Microwaves, Infrared, Bluetooth, Wi-Fi, WiMax.

Unit IV [Weightage=25% approx., Lectures=15]
IP Protocol: IP v4, IP v6, Addressing Schemes, Subnet & masking, DNS, Email, FTP, HTTP,
Common Network Connectivity Devices: Repeaters, Hubs, Switches, Routers, Gateways,
Bridges.

Text Books:
- "Data Communications and Networking", 5th edition, Behrouz A Forouzan, McGraw Hill, Indian Reprint 2017.
- "Computer Networks", 5th edition, Andrew S. Tannenbaum, David J. Wetherall, Pearson Publication.

Reference Books:
- "An Engineering Approach to Computer Networks", 2nd Edition, S. Keshav, Pearson Education.
- "Computer Networking: A Top-Down Approach", 7th Edition, James F. Kurose, Keith W. Ross, Pearson.
- "Computer Networks: Principles, Protocols and Practice", 2nd Edition, Olivier Bonaventure Create space Independent Publication.

Reference Links:
- https://www.tutorialspoint.com/data_communication_computer_network/dcn_quick_g uide.htm
- https://www.geeksforgeeks.org/computer-network-tutorials/
- https://www.javatpoint.com/computer-network-tutorial

BCA Semester – IV (Second Year)

Subject Title : **Business Communication**
Subject Code : AEC214-2C
Subject Type : AEC

Rationale:

- To help develop expressional skills in professional contexts.
- To facilitate the understanding of effective professional communication and skills required for the same.

Learning Outcomes:

The Students will be able to learn:
- Efficient use of both the expressional skills as per the requirement of the world of work.
- Basic process of professional writing.
- Ability to produce well-crafted basic structures of routine business communication.
- Skills and techniques for effective oral and written business communication.
- Use of web and how it can enhance work communication.

Teaching and Evaluation Scheme:

Credits	Duration in Hours		Maximum Marks		Total
	Theory	Practical	CCE (Formative)	SEE (Summative)	
2	30	-	50	50	100

Course Content:

Unit I   [Weightage=57% approx., Lectures=17]

Written Communication:

The writing process: How business communication is different from general communication, pre writing, writing and rewriting.

SOPs: importance, components, usability check and sample.

Process descriptions and instructions.

Writing for Business Structure: layout and style Acknowledgement letter, acceptance letter, Inquiry letter and order letter, Complaint letter and apology letter, Sales letter.

Report Writing: Formal and Informal reports definition, features, significance and types Informal reports- layouts, Formal report, Structure of a Formal report.

Unit II   [Weightage=33% approx., Lectures=10]

Persuasive communication:

Importance of argumentation and persuasion in communication, Ethical, emotional and Logical argumentation, Organize your persuasion.

Communicating for positive influence: need and Importance in Business, Using

conversational style and YOU attitude, using positive words, being courteous, avoid blaming refrain from preaching, be sincere, don't overdo.

Public Speaking: The PRPSA test developing confidence, preparing the speech, and delivering the same, Practical purview.

Unit III [Weightage=10% approx., Lectures=3]

Use of Web and digital tools for business:
Why the web is important for Business Communication, Characteristics of online communication, Considerations for Handheld mobile device.

Smartphones and communication.

Using collaborative writing tools and tips to use them effectively.

Reference Books:

- Technical Communication: Process and Product By: Gearson and Gearson, Pearson Publication.
- Technical Communication: A Practical approach, By: TVS Padmaja, Pearson Publication.
- Communication Skills, By Sanjay Kumar and Pushpa Lata, Oxford University PressPublication.
- Business Communication: Connecting in a digital world BY: Raymond Lesikar, McGrawHill Edu.

BCA Semester – IV (Second Year)

Subject Title : **Project Work-IV**
Subject Code : **SEC204-2C**
Subject Type : **SEC**

Rationale:

The core objective of the subject is to provide Project and Practical based deep learning, concept understanding, its analysis, deriving inferences and documenting it towards productive outcome of the subjects Python Programming, Web Design and Development and Operating System which is an integral part of the BCA curriculum.

Learning Outcomes:

In reference to the subjects Python Programming, Web Design and Development and Operating System the Students will be able to:

- Gain knowledge of Project based Practical aspect in the respective subject.
- Understand Fundamentals and Importance of the selected concept.
- Implement the learning during the specific course.
- Get real-life application experience during project execution.
- Perform teamwork and get acquainted with Project Based Learning.

Teaching and Evaluation Scheme:

Credits	Duration in Hours		Maximum Marks		Total
	Theory	Practical	CCE (Formative)	SEE (Summative)	
2	-	60	25	25	50

Course Content:

Project Work – IV   **[Weightage=100% approx., Practicals=60]**

Project Work – IV based on the areas pertaining to Python Programming, Web Design and Development and Operating System shall be executed based on choice based domain and Project titles will be selected in groups with specific count of members. The entire project work will be studied, analyzed, implemented inference learning will be derived and documented as well as presented in the three phases given below.

Phase I: Preliminary Learning

    1.1 Group Details

    1.2 Project Title

    1.3 Project Domain

    1.4 Project Definition

Phase II: Core Learning

    2.1 Project Overview

    2.2 Detail Explanation

    2.3 Advantages

    2.4 Challenges

Phase III: Inference Learning

    3.1 Real Life Applications

    3.2 Conclusion

    3.3 Future Enhancement

    3.4 Reference

Please Note: The Project Work shall be submitted as a Project Work – IV Presentation / Report / Project Demonstration.

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BCA Semester – IV (Second Year)

Subject Title : **Disaster Management**
Subject Code : **VAC207-2C**
Subject Type : **VAC**

Rationale:

The subject Disaster Management will enlighten the students about basic understanding of the Environment, Environmental Disasters and its Management. It also provides information about mitigation methodology for the Environmental Disasters. It also gives information about psychological health and mental therapies and social awareness.

Learning Outcomes:

The students will learn about the basic concepts of Disaster Management.

Teaching and Evaluation Scheme:

Credits	Duration in Hours		Maximum Marks		Total
	Theory	Practical	CCE (Formative)	SEE (Summative)	
2	30	-	25	25	50

Unit I   [Weightage=50% approx., Lectures=15]
Introduction Disaster: Understanding the concepts and definitions of Disaster.
General Concepts of Disaster: Hazard, Vulnerability, Risk.
Introduction, Primary concept, approaches to Disaster Risk Reduction for Disaster Management.
Various steps during Pre-Disaster Management: Risk Assessment and Analysis.

Unit II   [Weightage=50% approx., Lectures=15]
Management during Disaster and Post Disaster: Types, Trends, Causes, Consequences and Control of Geological Disasters (Earthquakes, Landslides, Tsunami), Hydro Disasters (Floods), Biological Disaster (Forest Fire), Technical Disaster (Chemical, Nuclear), Global Disasters Trends (Climate Change and Urban Disasters).

Reference Books:

- Modi C D & others (2006) Paryavaran and Aapatti Vyavasthapan [Gujarati], Swami Prakashan, Patan- 384265.
- Patel J C (2006) Paryavaran and disaster management [Gujarati], Parshwa publication, Ahmedabad-380001.
- Erachs Bharucha (2008,first edition) Paryavaran Adhyayan [Gujarati], Orient Longman Pvt. Ltd., Hyderabad.

- Distributor: M/S Himanshu book company, 06-07 Shri JayendrapuriBhavan, Ellisbridge, New Sanyas Ashram, Ahmedabad – 380 006.
- K RamanaMurthi, 2004 Disaster Management, Dominant Publishersand Distributors, New Delhi -110002.