BCA (Cloud Computing)

Semester-IV

L-3 T-0 P-0 C-3

24BCC120 T : IT infrastructure and Data Center

Course Objectives

- Introduction to data centers and their roles in enterprise and service provider environments.
- Understanding requirements such as physical space, power, cooling, and location for efficient data center operations.
- Designing and planning data center structures while adhering to building codes and security measures.
- Exploring various types of server farms and data center topologies to optimize performance.
- Implementing backup and recovery strategies for information availability and resilience.

Course Outcomes :

Students will be able to :

1. Understand the roles and architecture of data centers in enterprise and service provider environments.
2. Apply criteria for selecting data center locations and meeting prerequisites for physical infrastructure effectively.
3. Analyze guidelines and characteristics for planning and designing data center structures.
4. Evaluate different types of server farms and data center topologies for optimal infrastructure design.
5. Create business continuance infrastructure plans incorporating redundancy and backup technologies.

Articulation Matrix

(Program Articulation Matrix is formed by the strength of the correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	2	3	1	-	-	-	-	-	-	-	-	-
CO2	-	2	3	1	-	-	-	-	2	-	-	-
CO3	-	1	2	3	-	-	1	-	-	-	-	-
CO4	1	-	2	-	3	-	-	-	-	-	2	1
CO5	-	1	-	2	-	3	-	-	-	-	1	2

High-3 Medium-2 Low-1

Unit-I: Introduction to Data Centers 09 Hours

Datacenters Defined, Datacenter Goals, Datacenter Facilities, Roles Datacenters in the Enterprise, Roles of Datacenters in the Service Provider Environment, Application Architecture Models. The Client/Server Model and Its Evolution, n-Tier Model, Multi Tier Architecture Application Environment, Data Center Architecture.

Unit-II: Requirements for Data Centers **09 Hours**

Data Center Prerequisites, Required Physical Area for Equipment and Unoccupied Space, Required Power to Run All the Devices, Required Cooling and HVAC, Required Weight, Required Network Bandwidth, Budget Constraints, Selecting a Geographic Location, Safe from Natural Hazards, Safe from Man-Made Disasters, Availability of Local Technical Talent, Abundant and Inexpensive Utilities Such as Power and Water, Selecting an Existing Building (Retrofitting), tier standard.

Unit-III: Designing and Planning Data Center **09 Hours**

Characteristics of an Outstanding Design, Guidelines for Planning a Data Center, Data Center Structures, No-Raised or Raised Floor, Aisles, Ramp, Compulsory Local Building Codes, Raised Floor Design and Deployment, Plenum, Floor Tiles, Equipment Weight and Tile Strength, Electrical Wire ways, Cable Trays, Design and Plan against Vandalism.

Unit-IV: Server Farms **09 Hours**

Types of server farms and data centre, internet server farm, intranet server farm, extranet server farm, internet datacenter, corporate datacenter, software defined datacenter, datacenter topologies, Aggregation Layer, Access Layer, Front-End Segment, Application Segment, Back-End Segment, Storage Layer, Data Center Transport Layer, Data Center Services, IP infrastructure Services, Application Services, Security Services, Storage Services.

Unit-V: Backup and Recovery **09 Hours**

Business continuance infrastructure services, the need for redundancy, Information availability , BC terminology, BC planning life cycle, BC technology solutions, backup and recovery considerations , backup technologies, Uses of local replicas , Local replication technologies , Restore and restart considerations, Modes of remote replications , remote replication technologies.

Total 45 Hours

Reference Books:

1. IP Storage Networking by: Gary Oreinstein, Addison Wesley Professional, 2006
2. Information Storage and Management, G. Somasundaram – Alok Srivastava, Wiley; 1 edition
   (April 6, 2009)
3. Administering Data-Centers, Kailash Jayswal, Wiley; 1 edition (November 28, 2005)

List of e-Learning Resources:

1. https://nptel.ac.in/
2. https://www.coursera.org/

Prepared By	Academic Coordinator	HOD	Senior Faculty nominated by DOAA

BCA (Cloud Computing)
Semester-IV

L-3 T-0 P-0 C-3

24BCC130 T : Principles of Virtualization

Course Objectives:

- To know about various virtualization technologies, including server, storage, I/O, network, client, application, and desktop virtualization.
- To learn about Install and set up Windows Virtual PC on different platforms.
- To learn about Install and configure the RD Session Host Role Service on the server.
- To know about the Configure Remote Desktop Web Access and role-based application provisioning.
- To Learn about the HYPER-V role and create virtual machines.

Course Outcomes:

Students will be able to :

1. Understand various constraints and challenges in setting up a data center.
2. Apply the Enterprise level virtualization and access control in virtual machines .
3. Analyze Resource monitoring and execute backup and recovery of virtual machines.
4. Evaluate desktop Web Access and configuring client settings.
5. Create a list of virtualization Software available and monitor.

Articulation Matrix:-

(Program Articulation Matrix is formed by the strength of the correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO/PO /PSO	PO-BCA-01	PO-BCA-02	PO-BCA-03	PO-BCA-04	PO-BCA-05	PO-BCA-06	PO-BCA-07	PO-BCA-08	PO-BCA-09	PO-BCA-10	PSO-1	PSO-2
CO-1	2	3	-	-	-	-	-	-	-	-	-	-
CO-2	-	1	3	-	-	-	-	-	-	-	-	-
CO-3	-	1	3	3	-	1	-	-	-	-	-	-
CO-4	-	-	-	3	-	-	-	-	-	-	-	-
CO-5	-	-	-	-	3	-	-	-	-	-	-	-

High-3 Medium-2 Low-1

Unit-1: Exploring Virtualization Technologies **09 Hours**

Understanding Virtualization, Need of Virtualization and Virtualization Technologies: Server Virtualization, Storage Virtualization, I/O Virtualization, Network Virtualization, Client Virtualization, Application virtualization, Desktop virtualization, Understanding Virtualization Uses: Studying Server Consolidation, Development and Test Environments, Helping with Disaster Recovery.

Unit-II: Hardware Virtualization and Windows Installation **09 Hours**

Configure the BIOS to support hardware virtualization; Install and configure Windows Virtual

PC: installing Windows Virtual PC on various platforms (32-bit, 64-bit), creating and managing virtual hard disks, configuring virtual machine resources including network resources, preparing host machines; create, deploy, and maintain images.

Unit-III: Remote App Deployment Management **09 Hours**

Prepare and manage remote applications: configuring application sharing, package applications for deployment by using RemoteApp, installing and configuring the RD Session Host Role Service on the server.

Unit-IV: Application Access and Configuration **09 Hours**

Access published applications: configuring Remote Desktop Web Access, configuring role based
application provisioning, configuring Remote Desktop client connections. Configure client settings to access virtualized desktops: configuring client settings.

Unit-V: Exploring Virtualization Software Options **09 Hours**

List of virtualization Software available. Vmware- introduction to Vsphere, ESXi, CenterServer and Vsphere client. Creating Virtual Machine. Introduction to HYPER-V role. Create Virtual Machines. Create Hyper-v virtual networking, Use virtual Machine Snapshots. Monitor the performance of a Hyper-v server, Citrix XENDesktop fundamentals

Total Hours: 45

Reference Books:

1. Virtualization with Microsoft Virtual Server 2005 by TwanGrotenhuis, RogierDittner, Aaron Tiensivu, Ken Majors, Geoffrey Green, David Rule, Andy Jones, Matthijs ten Seldam, Syngress Publications, 2006
2. Virtualization--the complete cornerstone guide to virtualization best practices, Ivanka Menken, Gerard Blokdijk, Lightning Source Incorporated, 2008
3. Virtualization: From the Desktop to the Enterprise, Chris Wolf, Erick M. Halter, EBook, 2005

List of e-Learning Resources:

1. https://www.udemy.com
2. https://www.edx.org
3. https://www.coursera.com/

Prepared By	Academic Coordinator	HOD	Senior Faculty nominated by DOAA

BCA (Cloud Computing)

Semester-IV

L-3 T-1 P-0 C-4

24BCC140 T : Introduction to Python

Course Objectives

- To learn about Basics of Python programming.
- To know about Decision Making and Functions in Python.
- To learn about Object Oriented Programming using Python.
- To know about Files Handling in Python.
- To learn about GUI Programming and Database operations in Python.

Course Outcomes :

Students will be able to :

1. Understand the concepts of numbers, math functions, strings, lists, tuples, and dictionaries in Python.
2. Utilize list operations and set operations to manipulate data in Python.
3. Analyze the design and implementation of Python classes and objects in Object-Oriented Programming.
4. Assess the reliability and performance of file handling operations in Python scripts.
5. Create interactive GUI-based applications with database connectivity using Python frameworks to address specific user needs.

Articulation Matrix:-

(Program Articulation Matrix is formed by the strength of the correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	-	1	-	-	2	-	3	-	2	-	-	-
CO2	2		-	-	1	-	-	-	-	2	-	-
CO3	-	-	1	2	-	3	-	-	-	-	-	-
CO4	-	1	-	2	-	-	-	2	-	-	-	-
CO5	-	-	-	-	-	-	-	-	3	-	-	-

High-3 Medium-2 Low-1

Unit I **12 Hours**

Introduction, Origin, Comparison, Comments, Operators, Variables and Assignment, Numbers, Strings, Lists and Tuples, Dictionaries, if Statement, while Loop, for Loop and the range(),String and regular expressions. Module: Importing Module, Math Module, The sys Module, Random Module, and Package.

Unit II **12 Hours**

Functions: Defining a function, calling a function, Types of functions, Function Arguments, Anonymous functions, Built-in functions, Lists and Tuple: Introduction to List and Tuple, Accessing List and Tuple, Operations, working with List and Tuple, Function and Methods. Dictionaries: Working with dictionaries, properties and functions.

Unit III **12 Hours**

Object oriented programming and classes in Python - creating classes, instance objects, accessing members, Data hiding (the double underscore prefix), Built-in class attributes, Garbage collection: the constructor, Overloading methods and operators, Inheritance-implementing a subclass, overriding methods, Exceptions: try Statement, Exception Propagation, Except Clause, Try, Finally Clause, User Defined Exception, The raise statement.

Unit IV **12 Hours**

Creating files, Operations on files (open, close, read, write), File object attributes, file positions, Listing Files in a Directory, Testing File Types, Removing Files and Directories, Copying and Renaming Files, Splitting Path names, Creating and Moving to Directories, Traversing Directory Trees, Illustrative programs: word count, copy file.

Unit V **12 Hours**

Tkinter module, widgets and basics, Component, layout options, Button, Label, Entry, Listbox, Radio button, Check button, Scrollbar, Container Widgets: Frame, Event handling, Keyboard events, Mouse events etc. Introduction to MySQL, PYMYSQL Connections, using connect, cursor, execute & close functions, reading single & multiple results of query execution, executing different types of statements, understanding exceptions in database connectivity.

Total Hours: 60

Reference Books:

1. Python Essential by David M. Beazly.
2. Python Pocket by Mark Lutz.
3. Barry, Paul, Head First Python, 2nd Edition.
4. Python: The Complete Reference.

List of e-Learning Resources:

1. https://www.coursera.org/learn/python-programming-intro
2. https://www.codecademy.com/catalog/language/python
3. https://learn.microsoft.com/en-us/training/modules/intro-to-python/
4. https://developers.google.com/edu/python
5. https://www.python.org/about/gettingstarted/
6. https://ocw.mit.edu/courses/6-0001-introduction-to-computer-science-and-programming-in-python-fall-2016/

Prepared By	Academic Coordinator	HOD	Senior Faculty nominated by DOAA

BCA (Cloud Computing)

Semester-IV

L-3 T-1 P-0 C-4

24BCC150 T : Cloud Computing Applications-II

Course Objectives

- To learn jQuery events.
- To learn the basics concepts of Ajax.
- To provide the knowledge of basic PHP syntax and data types.
- To provide the knowledge of array loops and inbuilt methods.
- Working with HTML forms and handling data in PHP.

Course Outcomes:

Students will be able to :

1. Understand the basic jQuery functions such as Bind, Unbind, Click, DOM manipulation.
2. Apply PHP syntax and data types to develop dynamic web applications within the XAMPP environment.
3. Analyze control structures like if-else, switch, and loops to manage program flow and manipulate arrays effectively.
4. Evaluate array manipulation methods and function creation techniques for efficient data processing and optimization.
5. Create dynamic web forms integrated with PHP to interact with users, handle file operations, and manage user input securely.

Articulation Matrix

(Program Articulation Matrix is formed by the strength of the correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	-	3	1	-	2	-	-	-	-	-	-	-
CO2	1	-	3	-	-	2	-	-	2	-	-	-
CO3	2	1	-	3	-	-	1	-	-	-	-	-
CO4	1	-	2	-	3	-	-	-	-	-	2	1
CO5	-	1	2	-	-	3	-	-	-	-	1	2

High-3 Medium-2 Low-1

Unit-I: Introduction to jQuery 12 Hours

Introduction to jQuery, Bind and Unbind, Click, dblclick, focus, blur, change, Mousemove, mouseover, mouseout, Keypress, keyup, Disabling cut, copy, paste using jQuery, Disabling right click using jQuery, Filtering characters in a textbox using jQuery, Fade in, fade out, fade to, fade toggle, Show, hide, toggle, Slide down, slide up, slide toggle, etc

Introduction AJAX, AJAX Internals, Http Request Object, AJAX UI Tags, Div Tag, Submit Tag, Anchor Tag, Tabbed Panel Tag, Auto Completer Tag.

Unit –II: Introduction to PHP 12 Hours

Introduction to PHP, History of PHP, Web Brower, Server, Xampp, Installation and Configuration files, How PHP scripts work, Basic PHP syntax, PHP data types, Variable,

Constants, Variable scope, Operators, Variable manipulation, Dynamic variables, Static vs. Dynamic Optimization, PHP vs. JAVA.

Unit-III: Control Statements and Array **12 Hours**

If, else if, switch statement, loops: while, do while, for, foreach, breaking out of loops: Break, Continue, and exit. Array: Indexed arrays, Associative arrays, Multidimensional arrays, Getting the size of an array, Looping through an array, Looping through an associative array, Sorting arrays, Sorting an associative arrays.

Unit-IV: Functions **12 Hours**

Methods: count, sum, sort, rsort, asort, arsort, ksort, krsort, explode, implode, trim. Function, Creating a function, Returning value from function, User-defined functions, Dynamic function calls, passing arguments by value, passing arguments by reference.

Unit-V: Working with Form **12 Hours**

Working with Form: GET and POST data, Combine HTML and PHP code, Create user Forms using database, File Inclusion: Include(), Require(), Importing user input, Accessing user input, Using hidden fields, Redirecting the user, Upload a File, Delete a File.

Total Hours: 60

Reference Books:

1. Principles of Soft Computing, by S.N. Deepa S.N. Sivanandam
2. Russell, Stuart and Norvig, Peter, “Artificial Intelligence: A Modern Approach”.
3. Spivey, Michael, “An Introduction to Logic Programming”.
4. Weizenbaum, Joseph, “Computer power and human reason”.
5. Elaine Rich and Kevin Knight, “Artificial Intelligence”.
6. Dan W. Patterson, “Introduction to Artificial Intelligence and Expert Systems”.

List of e-Learning Resources:

1. https://nptel.ac.in/
2. https://www.coursera.org/

Prepared By	Academic Coordinator	HOD	Senior Faculty nominated by DOAA

BCA (Cloud Computing)

Semester-IV

L-0 T-0 P-4 C-2

24BCC140 P : Introduction to Python

Course Objectives

- To learn about Basics of Python programming.
- To know about Decision Making and Functions in Python.
- To learn about Object Oriented Programming using Python.
- To know about Files Handling in Python.
- To learn about GUI Programming and Database operations in Python.

Course Outcomes :

Students will be able to :

1. Understand basic Python programs using fundamental programming concepts.
2. Utilize and utilize Python's built-in data structures effectively.
3. Apply advanced Python features for writing efficient and organized code.
4. Analyze exceptions and perform file operations proficiently.
5. Create GUI applications and perform database CRUD operations using Python.

Articulation Matrix :

(Program Articulation Matrix is formed by the strength of the correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	-	1	-	-	2	-	3	-	2	-	-	-
CO2	2		-	-	1	-	-	-	-	2	-	-
CO3	-	-	1	2	-	3	-	-	-	-	-	-
CO4	-	1	-	2	-	-	-	2	-	-	-	-
CO5	-	-	-	-	-	-	-	-	3	-	-	-

High-3 Medium-2 Low-1

Unit I : Fundamentals of Python Programming **12 Hours**

Introduction to Python, Writing a simple Python program, Variables, data types, and input/output, Control structures (if-else, loops), Functions and modular programming

Unit II : Python Data Structures and Methods **12 Hours**

Lists and their methods, Tuples and their methods, Dictionaries and their functions, Sets and their operations

Unit III : Advanced Python Programming Concepts **12 Hours**

Anonymous functions (lambda), Modules and packages, Object-Oriented Programming (OOP) concepts, Classes and objects, Inheritance and method overriding, Special (double underscore) methods

Unit IV : Exception Handling and File Operations in Python **12 Hours**

Exception handling basics, User-defined exceptions, File operations (read, write, copy), Working with text and binary files

Unit V : Python GUI Development and Database Connectivity **12 Hours**

Introduction to Tkinter for GUI development, Creating basic GUIs (Login form, Registration form), Connecting Python to databases, Performing CRUD operations on databases

Total Hours: 60

List of Experiments

1. Write a program to convert temperature from Fahrenheit to Celsius depending upon user choice.
2. Write a program to use a dictionary and its functions in python.
3. Write a program to check whether given no is prime or not.
4. Write a program to implement a list and use its methods.
5. Write a program to implement tuple and use its methods.
6. Write a program to import modules and use it.
7. Write a user defined function to implement factorial of a given no.
8. Write a program to show the use of anonymous functions.
9. Write a program to calculate the area of rectangle and circle using class.
10. Write a program to implement single level inheritance.
11. Write a program to override methods.
12. Write a program to implement double underscore methods.
13. Write a program to implement Exception Handling.
14. Write a program for user defined exceptions.
15. Write a program to copy a file.
16. Write a program to count no. of words in a file.
17. Write a program to make Login GUI in Tkinter.
18. Write a program to make registration form GUI in Tkinter.
19. Write a program to connect with the database and perform insert operation.
20. Write a program to perform select operation on database.
21. Write a program to perform delete operations on databases.
22. Write a program to perform update operations on databases.

Reference Books:

1. Python Essential by David M. Beazly.
2. Python Pocket by Mark Lutz.
3. Barry, Paul, Head First Python, 2nd Edition.
4. Python: The Complete Reference.

List of e-Learning Resources:

1. https://www.coursera.org/learn/python-programming-intro
2. https://www.codecademy.com/catalog/language/python

3. https://learn.microsoft.com/en-us/training/modules/intro-to-python/
4. https://developers.google.com/edu/python
5. https://www.python.org/about/gettingstarted/
6. https://ocw.mit.edu/courses/6-0001-introduction-to-computer-science-and-programming-in-python-fall-2016/

Prepared By	Academic Coordinator	HOD	Senior Faculty nominated by DOAA

BCA (Cloud Computing)

Semester-IV

L-0 T-0 P-4 C-2

24BCC150 P : Cloud Computing Applications-II

Course Objectives

- To learn jQuery events.
- To learn the basics concepts of Ajax.
- To provide the knowledge of basic PHP syntax and data types.
- To provide the knowledge of array loops and inbuilt methods.
- Working with HTML forms and handling data in PHP.

Course Outcomes :

Students will be able to :

1. Understand the basic jQuery functions such as Bind, Unbind, Click, DOM manipulation.
2. Apply PHP syntax and data types to develop dynamic web applications within the XAMPP environment.
3. Analyze control structures like if-else, switch, and loops to manage program flow and manipulate arrays effectively.
4. Evaluate array manipulation methods and function creation techniques for efficient data processing and optimization.
5. Create dynamic web forms integrated with PHP to interact with users, handle file operations, and manage user input securely.

Articulation Matrix

(Program Articulation Matrix is formed by the strength of the correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	-	3	1	-	2	-	-	-	-	-	-	-
CO2	1	-	3	-	-	2	-	-	2	-	-	-
CO3	2	1	-	3	-	-	1	-	-	-	-	-
CO4	1	-	2	-	3	-	-	-	-	-	2	1
CO5	-	1	2	-	-	3	-	-	-	-	1	2

High-3 Medium-2 Low-1

Unit-I: jQuery Fundamentals **12 Hours**

Learn the basics of jQuery, including selecting elements, manipulating styles, and handling DOM elements. Practice finding textareas, setting borders, and adding classes.

Unit –II: jQuery UI Components **12 Hours**

Explore jQuery UI components such as accordions and date pickers. Learn how to initialize and customize these components, including setting icons and disabling buttons.

Unit-III: Basic Programming Concepts **12 Hours**

Understand fundamental programming concepts through practical examples. Write programs to determine even/odd numbers, generate multiplication tables, and check prime numbers.

Unit-IV: Advanced Programming Techniques **12 Hours**

Dive into more complex programming tasks, including calculating areas of shapes, performing arithmetic operations, and swapping values with and without a third variable.

Unit-V: Web Development MySQL **12 Hours**

Develop web forms using PHP and MySQL. Create a user registration form with various fields and connect it to a MySQL database. Build a user login form with validation and database integration.

Total Hours: 60

List of Experiments

1. Using jQuery find all textareas, and make a border. Then adds all paragraphs to the jQuery object to set their borders red.
2. Using jQuery add the class "w3r_font_color" and w3r_background to the last paragraph element.
3. Using jQuery add a new class to an element that already has a class.
4. Using jQuery insert some HTML after all paragraphs.
5. Using jQuery insert a DOM element after all paragraphs.
6. Convert three headers and content panels into an accordion. Initialize the accordion and specify the height.
7. Create a pre-populated list of values and delay in milliseconds between a keystroke occurs and a search is performed.
8. Initialize the button and specify the disable option.
9. Initialize the button and specify an icon on the button.
10. Initialize the button and do not show the label.
11. Create a simple jQuery UI Date picker. Now pick a date and store it in a textbox.
12. Initialize the date picker and specify a text to display for the week of the year column heading..
13. Write a program for finding an even or odd number.
14. Write a program to generate multiplication of the table which is given by the user.
15. Write a generated multiplication of the table with the given condition.
16. Write a program to check if a given number is prime or not.
17. Write a program for printing Fibonacci series.
18. Write a program to find the sum & average of array elements.
19. Write a program for finding areas of shapes using functions:
    a. Rectangle b. Square c. Circle d. 4. Triangle
20. Write a program for arithmetic operation using functions.
21. Write a program to swap two numbers using a third variable using a function.
22. Write a program to swap two numbers without using a third variable using a function.
23. Create a user Registration form (Field Name: First Name, Last Name, Username, Email, Password, Address) with MySQL database connection. .
24. Create a user Login form (Field Name: Username, Password. Note: Username and a. Password must be 7 characters/digits) with MySQL database connection.

Reference Books:

1. Principles of Soft Computing, by S.N. Deepa S.N. Sivanandam
2. Russell, Stuart and Norvig, Peter, “Artificial Intelligence: A Modern Approach”.
3. Spivey, Michael, “An Introduction to Logic Programming”.
4. Weizenbaum, Joseph, “Computer power and human reason”.
5. Elaine Rich and Kevin Knight, “Artificial Intelligence”.
6. Dan W. Patterson, “Introduction to Artificial Intelligence and Expert Systems”.

List of e-Learning Resources:

1. https://nptel.ac.in/
2. https://www.coursera.org/

Prepared By	Academic Coordinator	HOD	Senior Faculty nominated by DOAA

BCA (Cloud Computing)
Semester-IV

L-0 T-0 P-8 C-4

BCC160: Server Operating System-II

Course Objectives:

- To know about the plan and implement a Windows Server 2012 and Windows Server 2012 R2 environment.
- To Learn about critical Server Administration tasks for Windows Server 2012 and 2012 R2 environments
- To learn about centrally managed Windows®-based computers.
- To know about Configure core network services and Active Directory on Windows Server.
- To learn about configuring Active Directory.

Course Outcomes:

Students will be able to :

1. Understand the process of configuring Hyper-V for virtual machines and virtual networks.
2. Apply planning strategies for server infrastructure and implementation of Active Directory and Network Infrastructure.
3. Analyze Install and configure Windows Server 2012.
4. Evaluate the configuration of local storage and additional services such as file sharing.
5. Create the configuration process of Active Directory.

Articulation Matrix

(Program Articulation Matrix is formed by the strength of the correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	-	3	1	-	2	-	-	-	-	-	-	-
CO2	-	-	3	1	-	-	-	-	2	-	-	-
CO3	-	-	1	3	-	-	2	-	-	-	-	-
CO4	-	-	1	-	3	-	-	-	-	-	2	-
CO5	-	1	-	2	-	3	-	-	-	-	-	1

High-3 Medium-2 Low-1

Unit I : Fundamentals of Python Programming **24 Hours**

Introduction to Python, Writing a simple Python program, Variables, data types, and input/output, Control structures (if-else, loops), Functions and modular programming

Unit II : Python Data Structures and Methods **24 Hours**

Lists and their methods, Tuples and their methods, Dictionaries and their functions, Sets and their operations

Unit III : Advanced Python Programming Concepts **24 Hours**

Anonymous functions (lambda), Modules and packages, Object-Oriented Programming

(OOP) concepts, Classes and objects, Inheritance and method overriding, Special (double underscore) methods

Unit IV : Exception Handling and File Operations in Python **24 Hours**

Exception handling basics, User-defined exceptions, File operations (read, write, copy), Working with text and binary files

Unit V : Python GUI Development and Database Connectivity **24 Hours**

Introduction to Tkinter for GUI development, Creating basic GUIs (Login form, Registration form), Connecting Python to databases, Performing CRUD operations on databases

Total Hours: 120

List of Experiments

1. What is the purpose of creating a virtual machine in Hyper-V?
2. How do you allocate memory to a virtual machine in Hyper-V?
3. How can you adjust the CPU resources allocated to a virtual machine in Hyper-V?
4. What file format is used to store virtual hard disks in Hyper-V?
5. What is a virtual network switch in Hyper-V, and what are its types?
6. How do you configure network adapter settings for a virtual machine in Hyper-V?
7. What is the primary function of Network Load Balancing (NLB)?
8. How do you add a new node to an existing failover cluster?
9. How can you monitor the health of virtual machines in a failover cluster?
10. What is a common method for migrating virtual machines in Hyper-V?
11. What is the purpose of configuring advanced file services in Windows Server?
12. How does Dynamic Access Control (DAC) improve data security?
13. What tool is used to manage and configure storage in Windows Server?
14. How often should you perform a backup of Windows Server?
15. What is the difference between a bare metal recovery and a system state backup?
16. What is the purpose of creating a virtual machine in Hyper-V?
17. How do you allocate memory to a virtual machine in Hyper-V?
18. How can you adjust the CPU resources allocated to a virtual machine in Hyper-V?
19. What file format is used to store virtual hard disks in Hyper-V?
20. What is a virtual network switch in Hyper-V, and what are its types?
21. How do you configure network adapter settings for a virtual machine in Hyper-V?
22. What is the primary function of Network Load Balancing (NLB)?
23. How do you add a new node to an existing failover cluster?
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31. How do you create a new virtual machine in Hyper-V Manager?
32. What are the steps to enable Integration Services on a Hyper-V virtual machine?
33. How can you configure a virtual machine to use a dynamic virtual hard disk?
34. What is the purpose of a virtual machine checkpoint in Hyper-V?

35. How can you configure virtual network adapters for different types of virtual networks in Hyper-V?
36. What is the difference between a clustered and a standalone Network Load Balancing (NLB) setup?
37. How do you configure a failover cluster quorum configuration?
38. What is the role of a Hyper-V replica in disaster recovery?
39. How can you enable and configure Windows Server Backup to perform automatic backups?
40. What are the common troubleshooting steps for resolving boot issues on a Windows Server?
41. How do you create a new virtual machine in Hyper-V Manager?
42. What are the steps to enable Integration Services on a Hyper-V virtual machine?
43. How can you configure a virtual machine to use a dynamic virtual hard disk?
44. What is the purpose of a virtual machine checkpoint in Hyper-V?
45. How can you configure virtual network adapters for different types of virtual networks in Hyper-V?

Reference Books:

1. Active Directory Cookbook" by Robbie Allen and Laura E. Hunter
2. Windows Server 2012 Pocket Consultant" by William R. Stanek
3. Windows Server 2012 Inside Out" by William R. Stanek
4. Mastering Windows Server 2012 R2" by Mark Minasi

List of e-Learning Resources:

1. https://www.udemy.com/
2. https://www.udemy.com
3. https://www.coursera.org/co

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