LNCT UNIVERSITY, BHOPAL

Programme:- BCA (CA)   **Semester – VIII**   **wef: July 2025**

Name of Paper & Category	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Cloud Computing (Major)	BCA-801	4	2	0	70	30	100

Course Objective	The objective of this course is to provide students with the fundamentals and essentials of Cloud Computing. Also to provide students a sound foundation of the cloud computing so that they are able to start using and adopting Cloud Computing services and tools in their real life scenarios.

Units	Contents (Theory)	Hours /week
I	**Cloud Computing Overview:** Origins of Cloud computing, Cloud components, Essential characteristics, On-demand service, Broad network access, Location independent resource pooling, Rapid elasticity, measured service.	8
II	**Cloud scenarios, Benefits:** scalability, simplicity, vendor security, Limitations, Sensitive information, Application development, Security concerns, privacy concern with a third party, security level of third party, security benefits, Regularity issues and Government policies.	8
III	**Cloud architecture:** traditional IT Model Software as a Service (SaaS) : Saas service providers, Google App Engine, Salesforce.com and Google platform, Operational benefits, Economic benefits, Evaluating SaaS Platform as a Service (PaaS), PaaS service providers, Right Scale, Salesforce.corn, RackspaceForce.com, Services and Benefits.	8
IV	**Infrastructure as a Service (laaS):** IaaS service providers - Amazon EC2, GoGrid Microsoft, implementation and support, Amazon EC service, level agreement, Recent developments Benefits, Cloud deployment model: Public clouds, Private clouds, Community clouds, Hybrid clouds, Advantages of Cloud computing.	8
V	**Virtualization:** Virtualization and cloud computing, Need of virtualization, cost & administration, Types of hardware virtualization, Full virtualization, partial virtualization, Para-virtualization, Desktop virtualization, Software virtualization, Memory virtualization, Storage virtualization, Data virtualization, Network virtualization, Microsoft Hypervisor, VMware features and infrastructure, Virtual Box.	8

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Text Books/ Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Anthony T.Velte, Toby J.	Cloud computing a practical approach	2010	TATA McGraw- Hill, New Delhi
Michael Miller	Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate	2008	Que Publishing
Buyya, Selvi	" Mastering Cloud Computing "	-	TMH Pub
Kumar Saurabh	"Cloud Computing"	-	Wiley Pub

COURSE OUTCOMES: Students will be able to	
CO 1	Explain the core concepts of the cloud computing paradigm.
CO2	Analyze various cloud programming models and apply them to solve problems on the cloud.
CO3	Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing
CO4	Establishes and maintains all other components of the technology stack.
CO5	Expedite updates, improve software security, and maintain an efficient pipeline between development, testing, and deployment.

Name of Paper & Category	Paper Code	Theory					
		Credit			Marks		
		L	T	J	EST	CAT	Total
Data Science using Python (Minor)	BCA-802	3	1	0	70	30	100

Course Objective	The objective of this course is to teach students the concepts of Python Programming Language with Libraries.

Units	Contents (Theory)	Hours /week
I	**Python programming Basic**: Python interpreter, IPython Basics, Tab completion, Introspection, %run command, magic commands, matplotlib integration, python programming, language semantics, scalar types. Control flow.	8
II	**Data Structure, functions, files**: tuple, list, built-in sequence function, dict, set, functions, namescape, scope, local function, returning multiple values, functions are objects, lambda functions, error and exception handling, file and operation systems.	8
III	**NumPy-Array and vectorized computation:** Multidimensional array object. Creating ndarrays, arithmetic with numpy array, basic indexing and slicing, Boolean indexing, transposing array and swapping axes, universal functions, array-oriented programming with arrays, conditional logic as arrays operations, file input and output with array.	8
IV	**Pandas**: Pandas data structure, series, DataFrame, Index Object, Reindexing, dropping entities from an axis, indexing, selection and filtering, integer indexes, arithmetic and data alignment, function application and mapping, soring and ranking, correlation and covariance, unique values, values controls and membership, reading and writing data in text format.	8
V	**Visualization with Matplotlib**: Figures and subplots, colors, markers, line style, ticks, labels, legends, annotation and drawing on sublots, matplotlib configuration. Plotting with pandas and seaborn: line plots, bar plots, histogram, density plots, scatter and point plots, facet grids and categorical data.	8

Text Books/ Reference Books:-

Name of Authors	Titles of the Book	Edition	Name of the Publisher
Wes McKinney	Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython	2017	O'Reilly Media
Jake Vander Plas	Python Data Science Handbook: Essential Tools for Working with Data	2016	O'Reilly Media
Aurélien Géron	Hands-On Machine Learning with Scikit-Learn, Keras, and Tensor Flow: Concepts, Tools, and Techniques for Building Intelligent Systems	2019	O'Reilly Media

COURSE OUTCOMES: Students will be able to

CO1	Execute Python code in a variety of environments.
CO2	Work in python libraries.
CO3	Apply arithmetic operations on arrays using Numpy.
CO4	Work in pandas data structure.
CO5	Visualize data in matplotlib and plot charts.

Programme:- BCA (CA)   **Semester – VIII**   **wef: July 2025**

Name of Paper & Category	Paper Code	Practical				
		Credit		Marks		
Programming Lab in Cloud Computing (Major)	**BCA-803**	P	J	ESP	CAP	Total
		4	-	70	30	100

Contents (Practical) :-

1. Installation and configuration of Hadoop/Euceliptus etc.

2. Service deployment & Usage over cloud.

3. Management of cloud resources.

4. Using existing cloud characteristics & Service models.

5. Cloud Security Management.

6. Performance evaluation of services over cloud.

7. Write a program for web feed.

8. Study and implementation of Single-Sign-On.

9. User management in cloud.

10. Case study on Amazon EC2/ Microsoft Azure/ Google Cloud Platform.

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Name of Paper & Category	Paper Code	Practical				
		Credit		Marks		
		P	J	ESP	CAP	Total
Research Project (Field)	**BCA-804**	-	10	200	100	300

Evaluation parameters are:

- Define your research question or objective
- Review existing literature
- Develop a research plan
- Collect and analyze data
- Interpret and present findings
- Discuss implications and limitations
- Write the research report
- Seek feedback and revise
- Present and disseminate your research
- Reflect and learn from the process