



Programme	B.Sc. IT Honours (Data Science)					Branch	Computer Applications		
Semester	VI					Version	1.0.0.0		
Effective from Academic Year			2026-27			Effective for the batch Admitted in		June 2024	
Subject code	U76A2CDA		Subject Name			Cloud Data Analytics & Engineering			
Teaching scheme						Examination scheme(Marks)			
(Per week)	Lecture (DT)		Practical (Lab.)		Total		CCE	SEE	Total
	L	TU	P	TW					
Credit	2	-	2	-	4	Theory	50	50	100
Hours	2	-	4	-	6				

Objective:

To help students learn cloud-based data analytics and engineering so they can create and manage data pipelines, process data in the cloud, and generate useful insights using industry tools.

Pre-requisites:

- Python Programming I & II
- Basic SQL knowledge
- Data Mining fundamentals
- Basic understanding of statistics

Learning Outcome:

Name of CO	Description
CO1	Understand cloud computing, cloud analytics, and cloud data architecture
CO2	Analyze cloud storage and batch vs streaming data concepts
CO3	Apply SQL and data transformation concepts for cloud analytics
CO4	Understand data pipeline and data visualization concepts
CO5	Develop an end-to-end cloud analytics project using cloud tools and analytics concepts

Mapping of CO and PO:

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	1	1	2	1	2	1	2	2	1	1
CO2	3	2	2	2	3	1	2	2	2	1	1	1
CO3	3	2	2	2	3	1	2	2	2	1	1	1
CO4	3	2	3	2	3	3	2	2	3	2	2	1
CO5	3	2	3	2	3	2	2	3	3	2	2	2

Content:

Unit	Content	Hrs.
1	Cloud & Data Analytics Fundamentals Introduction to Cloud Computing, Traditional vs Cloud-based Analytics, Overview of Google Cloud Platform (GCP), Data Analytics Lifecycle, Big Data Fundamentals, Structured vs Unstructured Data, Overview of Cloud Data Architecture, Roles of Data Analyst and Data Engineer	06
2	Cloud Storage & BigQuery Data Ingestion Techniques, Batch vs Streaming Data, Introduction to Cloud Storage Systems, Data Warehouse Concepts, Introduction to BigQuery, Handling Data from APIs and Real-time Sources	06
3	SQL Analytics & Data Transformation SQL Queries and Data Filtering, Joins and Aggregate Functions, Subqueries and Window Functions, SQL-based Data Transformation, Data Cleaning and Preprocessing, Query	06

	Optimization Basics	
4	Data Pipelines & Visualization ETL and ELT Concepts, Data Pipeline Architecture, Workflow Automation Concepts, Introduction to Data Visualization, Dashboard and Report Creation, Business Intelligence and KPI Analysis	06
5	End-to-End Cloud Analytics Project Designing Cloud Data Architecture, Building Data Ingestion Pipeline, Data Transformation and Modeling, Dashboard and Report Development, Business Insight Generation, Capstone Project Presentation	06
Practical Content:		
List of practical specified by subject teacher based on above mentioned topics		
Reference Books:		
1	Kleppmann, M. (2017). Designing Data-Intensive Applications. O'Reilly.	
2	Reis, J., & Housley, M. (2022). Fundamentals of Data Engineering. O'Reilly.	
3	Surianarayanan, C. (2023). Essentials of Cloud Computing. Springer.	
Web Reference:		
1	https://cloud.google.com/docs	
2	https://skills.google.com	
MOOC/Certificate Course:		
1	https://www.skills.google/paths/420	
2	https://www.skills.google/paths/16/course_templates/1157	
Question Paper Scheme:		
	End Semester Examination Duration: (2 Hours Theory Examination) Note for Examiner: - Q-1 Any Five out of Seven (25 Marks) Q-2 Any Two out of Three (06 Marks) Q-3 Mandatory question (05 Marks) Q-4 Any Two out of Three (08 Marks) Q-5 Any Two out of Three (06 Marks) *The question paper must comprehensively address all Course Outcomes (COs), align with Bloom's Taxonomy levels, and ensure complete syllabus coverage.	