

Maharashtra State Board of Technical Education, Mumbai
LABORATORY PLANNING (LP)
Academic Year: 2026-2027

K-2

Date: 02/07/2026

Institute Name & Code: K. K. Wagh Polytechnic, Nashik (0078)

Program Name and Code: Artificial Intelligence and Machine Learning(AN)

Course Index: 506

Course Name: CLOUD COMPUTING FOR DATA SCIENCE

Course Abb and Code: CCD-315327

Semester: Vth **Scheme:** 'K' **Allocated Hrs:** 10

Name of Faculty: Mr. S.H.Sangale

Class: TYAN

• **Course Outcomes (COs):**

By learning the course CLOUD COMPUTING FOR DATA SCIENCE (CCD-315327) Third year AIML students will be able to:

- CO1 - Use Cloud-Based software services by comprehending the cloud Computing Architecture.
- CO2 - Configure Virtual Machines using Virtualization techniques.
- CO3 - Implement Virtualized storage system in Cloud
- CO4 - Use Machine Learning algorithms in Cloud Environment
- CO5 -. Deploy Machine Learning Models on Cloud

• **Teaching-Learning and Assessment Scheme:**

Course Code	Course Title	Abbr	Course Category/s	Learning Scheme					Credits	Assessment Scheme											
				Actual Contact Hrs./Week			SLH	NLH		Paper Duration	Theory				Based on LL & TL				Based on SL		Total Marks
				CL	TL	LL									Practical						
											FA-TH	SA-TH	Total		FA-PR		SA-PR		SLA		
															Max	Max	Max	Min	Max	Min	
315327	CLOUD COMPUTING FOR DATA SCIENCE	CCD	DSE	4	-	2	-	6	2	3	30	70	100	40	25	10	25#	10	-	-	150

Abbreviations: CL- Classroom Learning, LL-Laboratory Learning, NLH-Notional Learning Hours,

FA - Formative Assessment, SA -Summative assessment,

Legends: # External Assessment,

Note :

1. FA-TH represents average of two class tests of 30 marks each conducted during the semester.
2. If candidate is not securing minimum passing marks in FA-PR of any course then the candidate shall be declared as "Detained" in that semester.
3. Notional Learning hours for the semester are (CL+LL+TL+SL)hrs.* 10 Weeks.
4. 1 credit is equivalent to 30 Notional hrs.

• **Laboratory Learning Outcome (LLO):**

- ✓ LLO 1.1 Use Google Cloud Software Services
- ✓ LLO 2.1 Create Virtual Machine
- ✓ LLO 3.1 Create Web Server on Virtual Machine
- ✓ LLO 4.1 Create account on any cloud platform
- ✓ LLO 5.1 Use BigQuery to create tables and views
- ✓ LLO 6.1 Create instance and configure Block-Based storage
- ✓ LLO 7.1 Configure File-Based storage.
- ✓ LLO 8.1 Configure Object-Based storage.
- ✓ LLO 9.1 Upload dataset to Aws S3 bucket using Python script.
- ✓ LLO 10.1 Use Amazon Sagemaker notebook
- ✓ LLO 11.1 Build and Deploy a model using Amazon Sagemaker

• **Lab Plan:**

Sr. No.	CO.	LLO	Name of Practical	Planned Date		Actual Date	Remark/ Assessment Date with Staff Sign
				From	To		
1.	CO1	1.1	* Use Google Services to create Doc/Sheet/Keep/Forms	A-22/8/2026 B-18/8/2026 C-20/8/2026	A-29/8/2026 B-25/8/2026 C-27/8/2026		
2.	CO2	2.1	*Create Virtual Machine using VMware workstation for Windows/Linux	A-29/8/2026 B-25/8/2026 C-27/8/2026	A-05/9/2026 B-01/9/2026 C-03/9/2026		
3.	CO2	3.1	Create Web server (WAMP/XAMP/APACHE) on Virtual Machine	A-05/9/2026 B-01/9/2026 C-03/9/2026	A-12/9/2026 B-08/9/2026 C-10/9/2026		
4.	CO2	4.1	*Create an account on AWS or Azure, or Google Cloud Platform	A-12/9/2026 B-08/9/2026 C-10/9/2026	A-19/9/2026 B-15/9/2026 C-17/9/2026		
5.	CO3	6.1	Launch an EC2 instance with a specified configuration and configure Block-Based storage	A-19/9/2026 B-15/9/2026 C-17/9/2026	A-26/9/2026 B-22/9/2026 C-24/9/2026		
6.	CO3	7.1	*Create and Configure File-Based storage on EC2 instance	A-26/9/2026 B-22/9/2026 C-24/9/2026	A-3/10/2026 B-29/9/2026 C-1/10/2026		
7.	CO3	9.1	Write a script in Python to upload a dataset to an S3 bucket, list the files in the bucket, and download a file	A-3/10/2026 B-29/9/2026 C-1/10/2026	A-10/10/2026 B-6/10/2026 C-8/10/2026		
8.	CO4	10.1	*Create instance of Amazon Sagemaker notebook	A-10/10/2026 B-6/10/2026 C-8/10/2026	A-17/10/2026 B-13/10/2026 C-15/10/2026		
9.	CO4 CO5	11.1	* Build, test, tune, train, deploy and validate a model using Amazon Sagemaker	A-17/10/2026 B-13/10/2026 C-15/10/2026	A-17/10/2026 B-13/10/2026 C-15/10/2026		

• **Direct Assessment Criteria :(Practical):**

Process Related	Product Related	Total
15 Marks	10 Marks	25 Marks

• **Rules for Formative Assessment:**

Formative assessment (Assessment for Learning)

- Continuous assessment based on process and product related performance indicators.
- Each practical will be assessed considering 60% weightage to process, 40% weightage to product.
- A continuous assessment based term work.

Summative Assessment (Assessment of Learning)

- End semester examination, Lab performance, Viva-voce

- **Practical wise LLO-CO Mapping:**

Practical NO.	LLO	CO506.1	CO506.2	CO506.3	CO506.4	CO506.5
Practical 1	1.1	✓				
Practical 2	2.1		✓			
Practical 3	4.1		✓			
Practical 4	5.1			✓		
Practical 5	6.1			✓		
Practical 6	7.1			✓		
Practical 7	8.1			✓		
Practical 8	9.1			✓		
Practical 9	10.1				✓	
Practical 10	11.1				✓	✓

- **References:**

1. **Books:**

Sr. No.	Title of Book	Author	Publication
01	Handbook of Cloud Computing	Dr. Anand Nayyar	BPB Publication First Edition (1 January 2019) ISBN-10:9388176669 ISBN-13:978-9388176668
02	Cloud Computing: A Practical Approach By Toby Velte, Anthony Velte, Robert C	Toby Velte, Anthony Velte, Robert C	McGraw Hill Professional ISBN-978-0-07-162965-8
03	Cloud Computing for Data Analysis	Noah Gift, Alfredo Deza	Pragmatic AI Labs (No ISBN)
04	Data Science on the Google Cloud Platform: Implementing End-to-End Real-Time Data Pipelines	Valliappa Lakshmanan	O'Reilly Media, Inc. ISBN: 9781098118952
05	Machine Learning in the AWS Cloud: Add Intelligence to Applications with Amazon SageMaker	Abhishek Mishra	Wiley Publication ISBN: 978-1-119-55671-8

2. **Software Learning Websites**

Sr.No	Link / Portal	Description
1	https://www.geeksforgeeks.org/virtualization-in-cloud-computing-types/	Introduction to virtualization and cloud Computing and its types
2	https://www.javatpoint.com/virtualization-in-cloud-computing	Introduction to virtualization and cloud Computing
3	https://www.hostitsmart.com/blog/types-of-virtualization-in-cloud-computing-complete-overview/	Overview of cloud computing, types of Virtualization advantages and Application
4	https://aws.amazon.com/what-is/virtualization/	How can AWS help with virtualization and cloud computing?

5	https://www.run.ai/guides/machine-learning-in-the-cloud	Machine Learning in the Cloud, AWS Sagemaker Service for Machine Learning
Note : Teachers are requested to check the creative common license status/financial implications of the suggested online educational resources before use by the students		

3. URLs of Referred Videos:

1. AWS SageMaker Tutorial | Introduction To AWS SageMaker | AWS Tutorial For Beginners - <https://www.youtube.com/watch?v=AVNqdT5ilOg>
2. Introduction to Cloud ☐ Computing with Real Life Examples | Key Characteristics & Benefits - https://www.youtube.com/watch?v=3X4JfYf06_g
3. Virtualization | Virtualization Technology | What Is Virtualization- <https://www.youtube.com/watch?v=Wb68Exu6jtU>
4. What is Cloud Storage and How Does it Work | Cloud Storage Explained - <https://www.youtube.com/watch?v=56GVjTN6Mzc>
5. Why Cloud Computing is Critical for a Data Scientist - <https://www.youtube.com/watch?v=Ta2xatM9UBE>
6. Tutorial 1- Deployment of Models- Premises VS IAAS vs PAAS cloud Platforms – <https://www.youtube.com/watch?v=bjsJOl8gz5k&list=PLZoTAELRMXVOAvUbePX1lTdxQR8EY35Z1>

4. Tools :

5. VmWare Workstation Software, Aws, EC2 and Sagemaker instance with services,
6. MKCL ERA & Google Classroom used for Uploading Learning Material of Course, Assignments, Practice Test etc.

Mr. S.H.Sangale
(Name & signature of staff)

Prof. R.Y.Thombare
(Name & signature of HOD)

CC: 1. Course file- CCD(315327) 2. Lab Notice board 3.Lab file