



J.K.K. MUNIRAJAH COLLEGE OF TECHNOLOGY
Approved by AICTE, New Delhi And Affiliated to Anna University, Chennai.

Accredited by NAAC with "A" Grade



T.N. Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

REQUISITION LETTER

From,

Head of the Department,
Information Technology,
JKK Munirajah College of Technology,
T.N. Palayam.

To,

The Principal,
JKK Munirajah College of Technology,
T.N. Palayam.

Granted
22/8/23

Respected Sir,

Sub: Seeking permission for conducting a Certificate Program- Reg


We have planned to conduct a certificate program for III- and IV-year Information Technology students on **"CLOUD NATIVE DEVELOPMENT: BUILDING MICROSERVICES WITH KUBERNETES AND DOCKER"** from **28.08.2023 to 02.09.2023** by Program Coordinator Mr.L.THANARATHANAM, So, I request you to kindly provide a permission to conduct the certificate program.

Thanking You,

Yours Truly,

Place: T.N. Palayam

Date:22.08.2023


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Gobi (Tk), Erode (Dt).

Ints
22/8/23
in Kindly
Permit



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JKKMCT/CIRCULAR/AUG-23

23/08/2023

CIRCULAR

The Department of Information Technology is planning to organize a Certificate Program on "CLOUD NATIVE DEVELOPMENT: BUILDING MICROSERVICES WITH KUBERNETES AND DOCKER" (36 Hours) for the benefit of the students from 28.08.2023 (Monday) to 02.09.2023 (Saturday). Students those who are willing to attend the Program can enroll their names to their class in-charges respectively on or before 24.08.2023


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Copy To,
All the IODs and Staff Members,
All the Students,
Notice Board, File





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DEPARTMENT OF INFORMATION TECHNOLOGY



PROGRAM SYLLABUS

Name of the Certificate Program : CLOUD NATIVE DEVELOPMENT: BUILDING
MICROSERVICES WITH KUBERNETES AND
DOCKER

Program Code : 23ITCNDDBMKDCP01

Name of the Program Coordinator: Mr.L.THANARATHANAM

Academic Year: 2023-2024

Program Contents

Total Hours: 36

Chapter 1: Cloud-Native Development with Docker and Containers

- Overview of Cloud-Native Development and Benefits
- Introduction to Microservices Architecture and Key Principles
- Monolithic vs. Microservices Architecture
- What is Docker? Overview of Containerization
- Docker vs. Virtual Machines
- Setting Up Docker: Installation and Configuration
- Basic Docker Commands and Introduction to Docker Images and Registries

Chapter 2: Docker Images, Docker file, Networking, and Data Management

- Understanding Docker images and layers
- Writing Dockerfiles for building custom images
- Best practices for creating efficient Dockerfiles
- Multi-stage builds and caching
- Docker networking basics: Bridge, Host, and Overlay networks
- Exposing ports, linking containers, and container communication
- Docker Volumes and persistent data
- Introduction to Docker Compose for multi-container applications

Chapter 3: Introduction to Kubernetes, Core Concepts, Pods, and Deployments

- What is Kubernetes and Key Benefits for Microservices
- Kubernetes Architecture: Master Node and Worker Nodes
- Key Kubernetes Components: Pods, Nodes, Deployments, Services, and Namespaces
- Introduction to Kubernetes Cluster and kubectl CLI
- Setting Up a Local Kubernetes Cluster Using Minikube or Docker Desktop
- Understanding and Managing Pods in Kubernetes

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- Deploying and Scaling Applications with Kubernetes Deployments

Chapter 4: Kubernetes Services, Networking, and Configuration Management

- Understanding Kubernetes services: Cluster IP, Node Port, Load Balancer, and Ingress
- Exposing applications using Kubernetes services
- Configuring DNS within Kubernetes
- Service discovery and load balancing in Kubernetes
- Kubernetes ConfigMaps and Secrets
- Managing environment-specific configurations
- Securely storing sensitive information using Kubernetes Secrets
- Using Helm for configuration management in Kubernetes

Chapter 5: Scaling Applications and Monitoring & Logging in Kubernetes

- Horizontal Pod Autoscaling (HPA) and Vertical Scaling
- Resource requests and limits in Kubernetes
- Using Kubernetes metrics server for scaling
- Load balancing strategies for scaling microservices
- Overview of Kubernetes logging and monitoring
- Setting up monitoring with Prometheus and Grafana
- Collecting logs from containers and viewing them in Kubernetes
- Introduction to ELK Stack (Elasticsearch, Logstash, Kibana) for logs

Chapter 6: CI/CD with Kubernetes and Advanced Kubernetes & Docker Practices

- Setting up CI/CD pipelines for microservices
- Integrating Docker with Jenkins, GitLab, or GitHub Actions for automated builds and deployments
- Deploying microservices on Kubernetes using CI/CD pipelines
- Blue-Green and Canary Deployments in Kubernetes
- Security best practices for Docker and Kubernetes
- Image scanning and vulnerability management
- Kubernetes RBAC (Role-Based Access Control) and security policies
- Optimizing resource usage in Kubernetes clusters

Prepared by:

Name: **L. THANARATHANAY**

Designation: **Application Developer**

L. Thanarathnay
PROGRAM COORDINATOR

[Signature]
HOD

[Signature]

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DEPARTMENT OF INFORMATION TECHNOLOGY
PROGRAM SCHEDULE

Name of the Certificate Program : **CLOUD NATIVE DEVELOPMENT: BUILDING
MICROSERVICES WITH KUBERNETES AND
DOCKER**

Program Code : 23ITCNDBMKDCP01

Name of the Program Coordinator : Mr.L.THANARATHANAM

Program Period : 28.08.2023 to 02.09.2023

Date/ Time	9:30AM to 11:30AM (2 Hours)		11.45 AM to 12.45PM (1 Hour)		1:30 PM to 4.30 PM (3 Hours)
28-08-2023	Overview of Cloud-Native Development and Benefits, Introduction to Microservices Architecture and Key Principles		Monolithic vs. Microservices Architecture, What is Docker? Overview of Containerization		Docker vs. Virtual Machines, Setting Up Docker: Installation and Configuration, Basic Docker Commands and Introduction to Docker Images and Registries.
29-08-2023	Understanding Docker images and layers, Writing Dockerfiles for building custom images, best practices for creating efficient Dockerfiles	BREAK	Multi-stage builds and caching, Docker networking basics: Bridge, Host, and Overlay networks	LUNCH	Exposing ports, linking containers, and container communication, Docker Volumes and persistent data, Introduction to Docker Compose for multi-container applications.
30-08-2023	What is Kubernetes and Key Benefits for Microservices, Kubernetes Architecture: Master Node and Worker Nodes,		Key Kubernetes Components: Pods, Nodes, Deployments, Services, and Namespaces, Introduction to Kubernetes Cluster and kubectl CLI		Setting Up a Local Kubernetes Cluster Using Minikube or Docker Desktop, Understanding and Managing Pods in Kubernetes, Deploying and Scaling Applications with Kubernetes Deployments.

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31-08-2023	Understanding Kubernetes services: Cluster IP, Node Port, Load Balancer, and Ingress, exposing applications using Kubernetes services, Configuring DNS within Kubernetes	Service discovery and load balancing in Kubernetes, Kubernetes ConfigMaps and Secrets	Managing environment-specific configurations, Securely storing sensitive information using Kubernetes Secrets, Using Helm for configuration management in Kubernetes.
01-09-2023	Horizontal Pod Autoscaling (HPA) and Vertical Scaling, Resource requests and limits in Kubernetes, Using Kubernetes metrics server for scaling	Load balancing strategies for scaling microservices, Overview of Kubernetes logging and monitoring	Setting up monitoring with Prometheus and Grafana, Collecting logs from containers and viewing them in Kubernetes, for logs.
02-09-2023	Setting up CI/CD pipelines for microservices, Integrating Docker with Jenkins, GitLab, or GitHub Actions for automated builds and deployments, deploying microservices on Kubernetes using CI/CD pipelines,	Blue-Green and Canary Deployments in Kubernetes, Security best practices for Docker and Kubernetes	Image scanning and vulnerability management, Kubernetes RBAC (Role-Based Access Control) and security policies, Optimizing resource usage in Kubernetes clusters.


PROGRAM COORDINATOR


HOD


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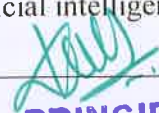
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RESOURCE PERSON PROFILE

Title of the Programme	CLOUD NATIVE DEVELOPMENT: BUILDING MICROSERVICES WITH KUBERNETES AND DOCKER
Duration and Timing of the Programme	36 Hours and 9.30 AM to 4.30 PM
Name of the Resource Person	Mr.L.THANARATHANAM
Photo Image of the Resource Person	
E-mail	thanarathanam.l@thoughtworks.com
Mobile No:	9566905846
Designation	Application Developer
Official Address	Thoughtworks Technologies(India) Pvt Ltd. KCT Tech Park, 1 st Floor, Thudiyalur Rd, Saravanampatti, Coimbatore, Tamil Nadu- 641049.
Educational Qualification	B.Tech - IT
Experience	12 years of Experience
Field of Interest	Cloud computing, Artificial intelligence


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DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR 2023-2024

WILLING STUDENTS NAMELIST

CERTIFICATE PROGRAM ON CLOUD NATIVE DEVELOPMENT:

BUILDING MICROSERVICES WITH KUBERNETES AND DOCKER

S.NO	REGISTER NUMBER	NAME	WILLINGNESS		
			YES	NO	SIGN
IV YEAR					
1	731220205001	AJAYSRI. A	✓		Ajy. A
2	731220205004	DEEPAK.A	✓		A. Deepak
3	731220205007	DHINESHKUMAR .M	✓		M. Dhinesh
4	731220205008	DINESH.S	✓		S. Dinesh
5	731220205009	GOKUL.S	✓		Gokul S
6	731220205011	KALAISELVI.K	✓		K. Kalai
7	731220205012	KAVIN.P	✓		P. Kavin
8	731220205013	LENA TAMILVANAN.G	✓		Lena
9	731220205014	MAYILRAJ.V	✓		V. Mayilraj
10	731220205015	MUTHUKUMAR.G	✓		M. Gokul
11	731220205016	PANDIYARAJ.C	✓		C. Pandi
12	731220205017	PARVATHY.A	✓		Parvathy. A
13	731220205018	PRIYANKA.S	✓		Priyanka. S
14	731220205019	RAMKUMAR.R	✓		R. Ramkumar
15	731220205020	RAVI SANKARAN.N	✓		N. Ravi Sankaran
16	731220205021	SHIJIN KUMAR.K. G	✓		Shijin K
17	731220205023	SRIRAM.V	✓		V. Sriram
18	731220205024	THANGESHWARI.G	✓		G. Thangeshwari

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19	731220205301	POORANESHWARAN.N	✓		N. Jeyaraj
20	731220205302	RAVINDHIRAN.R	✓		R. Raj.
21	731220205303	SHILPA.C	✓		C. Shilpa
III YEAR					
22	731221205003	BHUVANESWARAN M	✓		Bhuvan
23	731221205004	BOOPATHI C	✓		Boopathi C
24	731221205005	DEVIKA A	✓		Devika A.
25	731221205006	DHANALAKSHMI C	✓		Dhanalakshmi C
26	731221205007	DHARSHINI P	✓		(Dharshini P)
27	731221205008	DHAYALAN R	✓		Dhayalan R
28	731221205009	DINESH M	✓		Dinesh M
29	731221205010	DIVYA S	✓		Divya S
30	731221205011	KARTHICKRAJA G		✓	Karthick Raja G
31	731221205012	KAVIBHARATHI G	✓		Kavibharathi G
32	731221205013	KOWSALYA G	✓		G. Kowsalya
33	731221205015	KRISHNAN S	✓		Krishnan S
34	731221205016	MADHANKUMAR N	✓		Madhankumar N
35	731221205017	MAHADEVAMMA S	✓		Maha
36	731221205019	MANIGANDAN M	✓	✓	Manigandan M
37	731221205020	MANILA K	✓		Manila K
38	731221205021	MANOJKUMAR S	✓		Manoj Kumar S
39	731221205022	MAVURIYA D	✓		Mavuriya D
40	731221205023	MEGALA THANGAMANI M	✓		Megala Thangamani M
41	731221205026	MOTHIR L	✓		Mothir L
42	731221205027	MOUNA SAKTHI G	✓		Mouna Sakthi G

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43	731221205028	NANDHINI S	✓		S. Nandhini
44	731221205029	NAVEEN S	✓		Davey S
45	731221205030	PANDEESWARAN C K	✓		D. C. K.
46	731221205031	PARTHIBAN M	✓		P. M.
47	731221205032	RAKSHITHA B	✓		R. B.
48	731221205033	RATHNA R	✓		Rathna R
49	731221205034	RAVIKUMAR M		✓	R. M.
50	731221205035	RITHIK S	✓		R. S.
51	731221205036	ROHITH V	✓		R. V.
52	731221205037	SHARANKUMAR M V	✓		S. M. V.
53	731221205039	SUNDHARESWARI V	✓		S. V.
54	731221205040	SUYAMBURAJ C	✓		S. C.
55	731221205041	SWETHA S	✓		S. S.
56	731221205042	TAMILSELVAN M	✓		M. Tamilselvan
57	731221205044	YUSWANTHRAA R	✓		Yuswanthraa R
58	731221205301	AHALYA J C	✓		A. J. C.

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DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR 2023-2024

CERTIFICATE PROGRAM ON CLOUD NATIVE DEVELOPMENT:

BUILDING MICROSERVICES WITH KUBERNETES AND DOCKER

ENROLLED STUDENTS NAMELIST

DATE: 28.08.2023 to 02.09.2023

S.NO	REG. NO	NAME
IV YEAR		
1	731220205001	AJAYSRI. A
2	731220205004	DEEPAK.A
3	731220205007	DHINESHKUMAR .M
4	731220205008	DINESH.S
5	731220205009	GOKUL.S
6	731220205011	KALAISELVI.K
7	731220205012	KAVIN.P
8	731220205013	LENA TAMILVANAN.G
9	731220205014	MAYILRAJ.V
10	731220205015	MUTHUKUMAR.G
11	731220205016	PANDIYARAJ.C
12	731220205017	PARVATHY.A
13	731220205018	PRIYANKA.S
14	731220205019	RAMKUMAR.R
15	731220205020	RAVI SANKARAN.N
16	731220205021	SHIJIN KUMAR.K. G
17	731220205023	SRIRAM.V
18	731220205024	THANGESHWARI.G
19	731220205301	POORANESHWARAN.N
20	731220205302	RAVINDHIRAN.R
21	731220205303	SHILPA.C
III YEAR		
22	731221205003	BHUVANESWARAN M
23	731221205004	BOOPATHI C
24	731221205005	DEVIKA A

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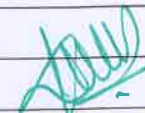
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25	731221205006	DHANALAKSHMI C
26	731221205007	DHARSHINI P
27	731221205008	DHAYALAN R
28	731221205009	DINESH M
29	731221205010	DIVYA S
30	731221205012	KAVIBHARATHI G
31	731221205013	KOWSALYA G
32	731221205015	KRISHNAN S
33	731221205016	MADHANKUMAR N
34	731221205017	MAHADEVAMMA S
35	731221205020	MANILA K
36	731221205021	MANOJKUMAR S
37	731221205022	MAVURIYA D
38	731221205023	MEGALA THANGAMANI M
39	731221205026	MOTHIR L
40	731221205027	MOUNA SAKTHI G
41	731221205028	NANDHINI S
42	731221205029	NAVEEN S
43	731221205030	PANDEESWARAN C K
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51	731221205040	SUYAMBURAJ C
52	731221205041	SWETHA S
53	731221205042	TAMILSELVAN M
54	731221205044	YUSWANTHRAA R
55	731221205301	AHALYA J C


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GOBI (TK), ERODE (D)


PROGRAM COORDINATOR


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DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR 2023-2024

CERTIFICATE PROGRAM ON CLOUD NATIVE DEVELOPMENT:

BUILDING MICROSERVICES WITH KUBERNETES AND DOCKER

ATTENDANCE SHEET

S. NO	REGISTER NO	NAME	ATTENDANCE OF THE PARTICIPANTS											
			28/8/2023		29/8/2023		30/8/2023		31/8/2023		01/9/2023		02/9/2023	
			FN	AN	FN	AN	FN	AN	FN	AN	FN	AN	FN	AN
IV YEAR														
1	731220205001	AJAYSRI. A	/	/	/	/	/	/	/	/	/	/	/	/
2	731220205004	DEEPAK.A	/	/	/	/	/	/	/	/	/	/	/	/
3	731220205007	DHINESHKUMAR .M	/	/	/	/	/	/	/	/	/	/	/	/
4	731220205008	DINESH.S	/	/	/	/	/	/	/	/	/	/	/	/
5	731220205009	GOKUL.S	/	/	/	/	/	/	/	/	/	/	/	/
6	731220205011	KALAISELVI.K	/	/	/	/	/	/	/	/	/	/	/	/
7	731220205012	KAVIN.P	/	/	/	/	/	/	/	/	/	/	/	/
8	731220205013	LENA TAMILVANAN.G	/	/	/	/	/	/	a	a	/	/	/	/
9	731220205014	MAYILRAJ.V	/	/	/	/	/	/	/	/	/	/	/	/
10	731220205015	MUTHUKUMAR.G	/	/	/	/	/	/	/	/	/	/	/	/
11	731220205016	PANDIYARAJ.C	/	/	/	/	/	/	/	/	/	/	/	/
12	731220205017	PARVATHY.A	/	/	/	/	/	/	/	/	/	/	/	/
13	731220205018	PRIYANKA.S	/	/	/	/	/	/	/	/	/	/	/	/
14	731220205019	RAMKUMAR.R	/	/	/	/	/	/	/	/	/	/	/	/
15	731220205020	RAVI SANKARAN.N	/	/	/	/	/	/	/	/	/	/	/	/
16	731220205021	SHIJIN KUMAR.K. G	/	/	/	/	/	/	/	/	a	a	/	/

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17	731220205023	SRIRAM.V	/	/	/	/	/	/	/	/	/	/	/	/
18	731220205024	THANGESHWARI.G	/	/	/	/	/	/	/	/	/	/	/	/
19	731220205301	POORANESHWARAN.N	/	/	/	/	/	/	/	/	/	/	/	/
20	731220205302	RAVINDHIRAN.R	/	/	/	/	a	a	/	/	/	/	/	/
21	731220205303	SHILPA.C	/	/	/	/	/	/	/	/	/	/	/	/
III YEAR														
22	731221205003	BHUVANESWARAN M	/	/	/	/	/	/	/	/	/	/	/	/
23	731221205004	BOOPATHI C	/	/	/	/	/	/	/	/	/	/	/	/
24	731221205005	DEVIKA A	/	/	/	/	/	/	/	/	/	/	/	/
25	731221205006	DHANALAKSHMI C	/	/	/	/	/	/	/	/	/	/	/	/
26	731221205007	DHARSHINI P	/	/	/	/	/	/	/	/	/	/	/	/
27	731221205008	DHAYALAN R	/	/	a	a	/	/	/	/	/	/	/	/
28	731221205009	DINESH M	/	/	/	/	/	/	/	/	/	/	/	/
29	731221205010	DIVYA S	/	/	/	/	/	/	/	/	/	/	/	/
30	731221205012	KAVIBHARATHI G	/	/	/	/	/	/	/	/	/	/	/	/
31	731221205013	KOWSALYA G	/	/	/	/	/	/	/	/	/	/	/	/
32	731221205015	KRISHNAN S	/	/	/	/	/	/	/	/	/	/	/	/
33	731221205016	MADHANKUMAR N	/	/	/	/	/	/	/	/	/	/	/	/
34	731221205017	MAHADEVAMMA S	/	/	/	/	/	/	/	/	/	/	/	/
35	731221205020	MANILA K	/	/	/	/	/	/	/	/	/	/	/	/
36	731221205021	MANOJKUMAR S	/	/	/	/	/	/	/	/	/	/	/	/
37	731221205022	MAVURIYA D	/	/	/	/	/	/	/	/	/	/	/	/
38	731221205023	MEGALA THANGAMANI M	/	/	/	/	/	/	/	/	/	/	/	/
39	731221205026	MOTHIR L	/	/	/	/	/	/	/	/	a	a	/	/

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40	731221205027	MOUNA SAKTHI G	/	/	/	/	a	a	/	/	/	/	/	
41	731221205028	NANDHINI S	/	/	/	/	/	/	/	/	/	/	/	
42	731221205029	NAVEEN S	/	/	/	/	/	/	/	/	/	/	/	
43	731221205030	PANDEESWARAN C K	/	/	/	/	/	/	/	/	/	/	/	
44	731221205031	PARTHIBAN M	/	/	/	/	/	a	a	/	/	/	/	
45	731221205032	RAKSHITHA B	/	/	/	/	/	/	/	/	/	/	/	
46	731221205033	RATHNA R	/	/	/	/	/	/	/	/	/	/	/	
47	731221205035	RITHIK S	/	/	/	/	/	/	/	/	/	/	/	
48	731221205036	ROHITH V	/	/	/	/	/	/	/	/	/	/	/	
49	731221205037	SHARANKUMAR M V	/	/	/	/	/	/	a	a	/	/	/	
50	731221205039	SUNDHARESWARI V	/	/	/	/	/	/	/	/	/	/	/	
51	731221205040	SUYAMBURAJ C	/	/	/	/	/	/	/	/	/	/	/	
52	731221205041	SWETHA S	/	/	/	/	/	/	/	/	/	/	/	
53	731221205042	TAMILSELVAN M	/	/	/	/	/	/	/	/	/	/	/	
54	731221205044	YUSWANTHRAA R	/	/	/	/	/	/	/	/	/	/	/	
55	731221205301	AHALYA J C	/	/	/	/	/	/	/	/	/	/	/	
TOTAL NO OF STUDENTS PRESENT			55	55	54	54	53	53	53	53	52	52	55	55
TOTAL NO OF STUDENTS ABSENT			NIL	NIL	01	01	02	02	02	02	03	03	NIL	NIL
SIGNATURE OF THE PROGRAM COORDINATOR														
SIGNATURE OF THE HOD														

PROGRAM COORDINATOR

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DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR 2023-2024



CLOUD NATIVE DEVELOPMENT: BUILDING MICROSERVICES

WITH KUBERNETES AND DOCKER

ASSESSMENT

ANSWER ALL QUESTIONS (30*1=30 MARKS)

1. **What is Docker?**
 - a) A virtual machine manager
 - b) A platform for managing containers
 - c) A type of database
 - d) A tool for managing virtual machines
2. **Docker containers?**
 - a) Host
 - b) Bridge
 - c) Overlay
 - d) Macvlan
3. **What command is used to build a Docker image from a Dockerfile?**
 - a) docker create
 - b) docker build
 - c) docker run
 - d) docker deploy
4. **In Docker, what is a container?**
 - a) A lightweight, executable package of software
 - b) A set of virtual machines
 - c) A network manager
 - d) A web server
5. **Which Docker command is used to list all running containers?**
 - a) docker ps
 - b) docker list
 - c) docker show
 - d) docker containers
6. **What does a Dockerfile do?**
 - a) Defines the structure and behavior of a container

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- b) Creates a container
 - c) Installs Docker on a machine
 - d) Defines the machine environment
7. **Which command is used to run a container from a Docker image?**
- a) docker start
 - b) docker run
 - c) docker execute
 - d) docker deploy
8. **What is the purpose of Docker Compose?**
- a) To define and manage multi-container Docker applications
 - b) To monitor Docker containers
 - c) To push images to Docker Hub
 - d) To scale Docker containers
9. **What is Kubernetes?**
- a) A type of operating system
 - b) A platform for managing containers in clusters
 - c) A programming language
 - d) A hardware abstraction layer
10. **Which of the following is a component of the Kubernetes control plane?**
- a) Node
 - b) Pod
 - c) kube-apiserver
 - d) ReplicaSet
11. **What is a Kubernetes pod?**
- a) A group of nodes
 - b) The smallest deployable unit in Kubernetes
 - c) A type of container
 - d) A way to organize clusters
12. **Which Kubernetes object is used to ensure a specified number of pod replicas are running at any time?**
- a) Deployment
 - b) ReplicaSet
 - c) Service
 - d) Namespace


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13. Which Kubernetes object exposes a set of pods as a network service?
- Pod
 - Deployment
 - Service
 - Volume
14. In Kubernetes, what is the function of the kube-scheduler?
- Manages the cluster's persistent storage
 - Schedules the pods to run on nodes
 - Monitors node health
 - Controls access to the Kubernetes API server
15. What is the main purpose of Kubernetes namespaces?
- To organize clusters into environments like dev, test, and prod
 - To monitor container resource usage
 - To define network policies
 - To store persistent data
16. Which of the following is used to deploy a set of replicas of a pod in Kubernetes?
- Deployment
 - StatefulSet
 - DaemonSet
 - ReplicaSet
17. Which command is used to view the status of Kubernetes pods?
- kubectl pods
 - kubectl status
 - kubectl get pods
 - kubectl describe pods
18. Which of the following is NOT a feature of Kubernetes?
- Automated deployment
 - Horizontal scaling
 - Load balancing
 - Compilation of code
19. What is the role of the Kubernetes kubelet?
- Ensures that containers are running in the cluster
 - Manages Kubernetes cluster resources
 - Deploys pods to nodes

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- d) Monitors the health of the control plane
20. **What is a Kubernetes StatefulSet used for?**
- a) To manage applications with stable, unique network identities
 - b) To deploy stateless applications
 - c) To manage application scaling
 - d) To update the image of pods
21. **What is the primary advantage of using microservices architecture?**
- a) Monolithic applications are easier to deploy
 - b) Microservices allow more granular scaling
 - c) It reduces the need for automation
 - d) Microservices applications are always more secure
22. **Which Kubernetes object is ideal for scaling a microservices application?**
- a) StatefulSet
 - b) Deployment
 - c) ReplicaSet
 - d) Service
23. **How do you enable communication between microservices in Kubernetes?**
- a) By using Services and Ingress controllers
 - b) By using StatefulSets
 - c) By using persistent volumes
 - d) By using Secrets
24. **Which tool can be used for managing microservices in Kubernetes?**
- a) Helm
 - b) Docker Compose
 - c) Kubernetes CLI
 - d) Both a and c
25. **Which of the following is a common pattern used in microservices to handle inter-service communication?**
- a) Shared databases
 - b) REST API
 - c) File-based communication
 - d) Message queues only
26. **What is a Kubernetes Ingress?**
- a) A way to expose services outside of the cluster


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- b) A tool for monitoring Kubernetes clusters
 - c) A configuration file for pods
 - d) A persistent volume manager
27. Which tool is commonly used to manage dependencies in microservices on Kubernetes?
- a) Helm
 - b) Docker Compose
 - c) Terraform
 - d) Kubernetes Dashboard
28. Which design pattern is often used for decoupling microservices?
- a) Singleton pattern
 - b) Circuit breaker pattern
 - c) Factory pattern
 - d) Adapter pattern
29. What is a common problem when using microservices?
- a) Centralized logging
 - b) Service discovery and communication
 - c) Reduced deployment complexity
 - d) Monolithic architecture
30. Which of the following is a common method for managing state in microservices?
- a) Using shared memory
 - b) Using external databases or caching systems
 - c) Using persistent local storage
 - d) Avoiding the use of state altogether


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DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR 2023-2024

CERTIFICATE PROGRAM ON "CLOUD NATIVE DEVELOPMENT:

BUILDINGMICROSERVICES WITH KUBERNETES AND DOCKER"

STUDENTS MARKLIST

DATE: 28.08.2023 to 02.09.2023

S.NO	REG. NO	NAME	MARKS
IV YEAR			
1	731220205001	AJAYSRI. A	91
2	731220205004	DEEPAK.A	85
3	731220205007	DHINESHKUMAR .M	82
4	731220205008	DINESH.S	80
5	731220205009	GOKUL.S	95
6	731220205011	KALAISELVI.K	97
7	731220205012	KAVIN.P	83
8	731220205013	LENA TAMILVANAN.G	78
9	731220205014	MAYILRAJ.V	81
10	731220205015	MUTHUKUMAR.G	92
11	731220205016	PANDIYARAJ.C	96
12	731220205017	PARVATHY.A	93
13	731220205018	PRIYANKA.S	95
14	731220205019	RAMKUMAR.R	90
15	731220205020	RAVI SANKARAN.N	96
16	731220205021	SHIJIN KUMAR.K. G	92
17	731220205023	SRIRAM.V	88
18	731220205024	THANGESHWARI.G	95
19	731220205301	POORANESHWARAN.N	92
20	731220205302	RAVINDIHIRAN.R	89
21	731220205303	SHILPA.C	93
III YEAR			
22	731221205003	BHUVANESWARAN M	85
23	731221205004	BOOPATHI C	92
24	731221205005	DEVIKA A	
25	731221205006	DHANALAKSHMI C	

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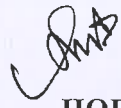


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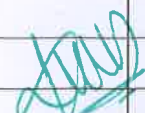
26	731221205007	DHARSHINI P	78
27	731221205008	DHAYALAN R	64
28	731221205009	DINESH M	87
29	731221205010	DIVYA S	79
30	731221205012	KAVIBHARATHI G	93
31	731221205013	KOWSALYA G	77
32	731221205015	KRISHNAN S	95
33	731221205016	MADHANKUMAR N	82
34	731221205017	MAHADEVAMMA S	86
35	731221205020	MANILA K	79
36	731221205021	MANOJKUMAR S	68
37	731221205022	MAVURIYA D	78
38	731221205023	MEGALA THANGAMANI M	86
39	731221205026	MOTHIR L	<u>42</u>
40	731221205027	MOUNA SAKTHI G	<u>46</u>
41	731221205028	NANDHINI S	85
42	731221205029	NAVEEN S	95
43	731221205030	PANDEESWARAN C K	93
44	731221205031	PARTHIBAN M	91
45	731221205032	RAKSHITHA B	96
46	731221205033	RATHNA R	89
47	731221205035	RITHIK S	95
48	731221205036	ROHITH V	<u>47</u>
49	731221205037	SHARANKUMAR M V	96
50	731221205039	SUNDHARESWARI V	85
51	731221205040	SUYAMBURAJ C	82
52	731221205041	SWETHA S	93
53	731221205042	TAMILSELVAN M	85
54	731221205044	YUSWANTHRAA R	88
55	731221205301	AHALYA J C	95

Note: The students those who have secured above 50 Marks and above are consider eligible for program completion.


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DEPARTMENT OF INFORMATION TECHNOLOGY

ACADEMIC YEAR 2023-2024

SUMMARY/ OUTCOME REPORT

Name of the Certificate Program : **CLOUD NATIVE DEVELOPMENT: BUILDING
MICROSERVICES WITH KUBERNETES AND DOCKER**

Program Code : 23ITCNDBMKDCP01

Name of the Program Coordinator: Mr.L.THANARATHANAM

Duration : 36 Hours

Number of Students Enrolled :55

Number of Students Completed : 52

I hereby affirm that the entire Program contents in the Certificate Program "**Cloud Native Development: Building Microservices with Kubernetes and Docker**" listed in the Syllabus have been actually learned by the students as the part of the prescribed co-curricular activities through Certificate Program.

I confirmed that the Certificate Program title as **Cloud Native Development: Building Microservices with Kubernetes and Docker** Work Bench was done by me in the beginning of this semester and Program delivery with attendance of the students were recorded.

I confirmed that all registered students for this Certificate Program were actively attended and learned well throughout the duration of this Program. And all students were successfully completed and eligible to receive the participation certificate.

OUTCOME: Students shall be able to gain the knowledge in


- Learn to use Docker for creating, deploying, and managing consistent containerized applications across environments.
- Gain skills in Kubernetes for automating deployment, scaling, and management of containerized applications.
- Understand microservices architecture to design and build applications with independent, smaller services.
- Integrate Docker and Kubernetes with CI/CD pipelines for automated testing, building, deployment, and scaling of microservices.

Name : Mr.L.THANARATHANAM

Designation: Application Developer


PROGRAM COORDINATOR


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