Certified Microservices with AI Specialist (CMAIS)

INTRODUCTION

Microservices is considered as the next generation services architecture that addresses the pain points associated with the traditional enterprise Service Oriented Architecture. The global market for microservice is expected to grow at approx. USD 33 Billion by 2023, at 17% of CAGR between 2017 and 2023.

These developments are partly because of the work at companies such as Netflix, Amazon, and e-Bay which have visibly applied microservices. In fact, these companies have not only adopted microservices practices, but they have also shared the insights and even tools with the tech community.

The growth of public cloud services provided by enterprise companies such as Amazon, Microsoft, and Google have put an emphasis on the “as a service” business model, that allows companies to pick and choose necessary microservices.

Though cloud-based solutions such as such as software as a service (SaaS) and platform as a service (PaaS) are commonly used service offerings, businesses will also begin to adopt

machine learning as a service (MLaaS) into their technology stack for many reasons, the main reason being the need to achieve digital transformation.

With advanced cloud computing on AI, businesses can enhance product capabilities, better interact with customers, and create predictive business strategies

Advanced cloud computing in AI helps answer questions such as:

1. After training Machine Learning models on the data, how are these models put into production?
2. When there are different model versions, written in a mix of frameworks how is Continuous Integration and Continuous Delivery achieved?
3. When do users need to chain algorithms and run ensembles in parallel how is the latency optimized on the servers where these algorithms run?
4. How do applications built with intelligent agents, run, recover from any error and scale without any human assistance?

This course on advanced computing with AI explains microservices, its orchestration and how Machine Learning will be a natural fit for Microservice architecture and container orchestration.

Through this course, participants will learn why microservices are well-suited to modern cloud environments that require short development and delivery cycles. Participants will be taught the characteristics of microservices, its comparison with monolithic style, technology choices, and microservice architecture

Microservices deployed in the back-end cloud infrastructure enable developers to focus on modeling and coding for Machine Learning.

Though this course participant will be able to containerize application by creating Docker configuration files and use the open source container orchestration tool Kubernetes, for automating deployment and management of containers.

The participants will be able to appreciate how the typical workloads in Machine Learning which need specialized hardware like GPU can be handled by a platform such as Kubernetes and with an open source project Kubeflow.
Kubeflow handles the Machine Learning stack for Kubernetes.

Finally, as developers face the heterogeneous multi-clouds environments and AI tools, they should also demand industry-standard DevOps toolchain for building, deploying, and be optimizing micro-services which are covered in this course

COURSE OUTCOMES

- Understand the evolution of a software architecture from monolithic to micro services
- Understand micro service architecture and its importance in Machine Learning
- Introduction to the open source Kubernetes by Digital Ocean
- Understand and implement in Kubeflow - The Machine Learning stack for Kubernetes.
- Design and develop a microservice application using Docker and orchestrate using Kubernetes.
- Design and develop TensorFlow serving to launch TensorFlow model in production
- Design and demonstrate TensorFlow predictive model microservice

PROGRAM STRUCTURE

This is a 4-day intensive training program with the following assessment components.

Component 1. Written Examination

Component 2. Project Work Component (PWC)

These components are individual based. Participants will need to obtain 70% in both the components in order to qualify for this certification. If the participant fail one of the components, they will not pass the course and have to re-take that particular failed component. If they fail both components, they will have to re-take the assessment.

COURSE SESSION SCHEDULE

Day 1	**Session 1 (9:00 – 10:30)**	**Session 2 (10:40 – 12:40)**	**Session 3 (13:40 – 15:10)**	**Session 4 (15:10 – 18:10)**
	Micro services architecture	Micro services architecture	Micro services architecture	Containers with Docker and Docker concepts
Day 2	**Session 1 (9:00 – 10:00)**	**Session 2 (10:10 – 11:10)**	**Session 3 (11:10 – 12:10)**	**Session 4 (13:10 – 18:10)**
	Containers with Docker and Docker concepts	Containers with Docker and Docker concepts	DevOps	DevOps
Day 3	**Session 1 (9:00 – 10:30)**	**Session 2 (10:40 – 12:40)**	**Session 3 (13:40 – 15:40)**	**Session 4 (15:40 – 18:40)**
	Kubernetes	Kubernetes	Kubernetes	Kubeflow
Day 4	**Session 1 (9:00 – 10:00)**	**Session 2 (10:10 – 12:10)**	**Session 3 (13:10 – 15:10)**	**Session 4 (15:10 – 17:40)**
	Kubeflow	TensorFlow in production TensorFlow serving	TensorFlow in production TensorFlow serving	CMAIS examination

COURSE OUTLINE

Unit 1. Micro services architecture

- From Monolithic to Micro services
- Core principles that govern micro service architecture
- Micro services architecture
- Technology choices in micro services
- Case Study: How Netflix scales micro services with application data caching
- Machine Learning as micro service in Python

Unit 2. Containers with Docker and Docker concepts

- Docker vs Virtual Machine
- Docker and Docker concepts
- Docker Architecture
- Deploying micro services using containers
- Orchestration tools
- Securing micro services
- Docker eco system in Machine Learning

Unit 3. DevOps

- DevOps Tool chain
- Docker Compose - A packaging tool for DevOps
- DevOps in Machine Learning
- Continuous integration and delivery for microservice
- Case study- Continuous Integration in Machine Learning

Unit 4. Kubernetes

- Kubernetes Architecture
- Kubernetes master-node architecture
- Kubernetes cluster services

Unit 5. Kubeflow

- Kube fundamentals
- Kubeflow
- Kubeflow components

Unit 6. TensorFlow in production – TensorFlow serving

- Deploy TensorFlow model in production
- Introduction to TensorFlow serving
- Steps involved in TensorFlow serving
- TensorFlow serving architecture

PRE-REQUISITES

Participants are preferred to have experience in software development, business domain or data/business analysis.