

### Unit 3

Image Analysis: Transfer Learning, Attention models- Ensemble Methods for Signal and Image Analysis.

#### Text Books / Reference Books

Bishop C.M, “Pattern Recognition and Machine Learning”, Springer, 1st Edition, 2006.

Goodfellow I, Bengio Y, Courville A, & Bengio Y, “Deep learning”, Cambridge: MIT Press, 1st Edition, 2016.

Soman K.P, Ramanathan. R, “Digital Signal and Image Processing – The Sparse Way”, Elsevier, 1st Edition, 2012.

#### Evaluation Pattern

Assessment	Internal/External	Weightage (%)
Assignments (Minimum 2)	Internal	30
Quizzes (Minimum 2)	Internal	20
Mid-Term Examination	Internal	20
Term Project/ End Semester Examination	External	30

22AIE305

INTRODUCTION TO CLOUD COMPUTING

L-T-P-C: 2- 0- 3- 3

#### Course Objectives

- This course introduces the basic principles of cloud computing, cloud native application development and deployment, containerization principles, micro-services and application scaling.
- This course will also equip the students to understand major industry players in the public cloud domain for application development and deployment.

#### Course Outcomes

After completing this course, the students will be able to

**CO1:** Demonstrate the functionalities of cloud computing.

**CO2:** Apply cloud native application development for containerization and container orchestration.

**CO3:** Analyze different types of cloud services – Delivery models, Deployment models.

**CO4:** Implement different solution approaches in Cloud – containers in public cloud, setting up private cloud and convert monolithic applications to containers.

#### CO-PO Mapping

PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO															
CO1	3	1	1	-	-	-	-	-	-	-	1	-	-	-	-
CO2	3	2	2	2	3	2	3	2	2	2	2	2	-	1	2
CO3	3	2	2	2	3	2	3	2	1	-	2	-	-	2	3
CO4	3	2	2	2	3	2	3	2	2	2	2	2	-	2	3

## Syllabus

### Unit 1

Distributed Computing Taxonomy – Cluster, Grid, P2P, Utility, Cloud, Edge, Fog computing paradigms; Introduction to Cloud Computing – Cloud delivery models (XaaS), Cloud deployment models (Private, Public, Hybrid); Characteristics of Cloud, Major use cases of Cloud; disadvantages and best practices; Major public cloud players in the market; Security Issues and Challenges; Cloud Native application development – Introduction to JavaScript Cloud native application development

### Unit 2

Public Cloud – Using public cloud for infrastructure management (compute and storage services), Web application deployment using public cloud services, and Deploying container images in public cloud, Overview of cognitive services, Case study on architecting cloud-based solutions for a chosen scenario.

### Unit 3

Virtualization – Basics, Cloud vs Virtualization, Types of virtualizations, Hypervisor types; Containers – Introduction to dockers and containers, containerization vs virtualization, docker architecture, Use cases, Learn how to build container images, Operations on container images; Kubernetes – Need for orchestration, container orchestration methods, Introduction to Kubernetes, Kubernetes architecture, using YAML file, Running Kubernetes via minikube.

### Textbooks/References

*Rajkumar Buyya et.al. Mastering cloud computing, McGraw Hill Education; 2013.*

*Matthias K, Kane SP. Docker: Up & Running: Shipping Reliable Containers in Production. " O'Reilly Media, Inc."; 2018.*

*Gift, Noah. Pragmatic AI: An Introduction to Cloud-based Machine Learning. Addison-Wesley Professional, 2018*

*Kocher PS. Microservices and Containers. Addison-Wesley Professional; 2018.*

*Sarkar A, Shah A. Learning AWS: Design, build, and deploy responsive applications using AWS Cloud components. Packt Publishing Ltd; 2018.*

*Menga J. Docker on Amazon Web Services: Build, deploy, and manage your container applications at scale. Packt Publishing Ltd; 2018.*

*Bentley W. OpenStack Administration with Ansible 2. Packt Publishing Ltd; 2016*

### Evaluation Pattern

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Quizzes (Minimum 2)	Internal	20
Mid-Term Examination	Internal	20
Term Project/ End Semester Examination	External	30

19LIV390

LIVE-IN-LAB I

L-T-P-C: 0-0-0-3

### Course Objectives

- Identify and analyse the various challenge indicators present in the village by applying concepts of Human Centered Design and Participatory Rural Appraisal.