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**School of Information Sciences & Technology**

**Computer Science Department**

ICC 7220: Cloud Application Development

Lecturer: D Fadaraliki

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**Course Outline**

**Course Learning Outcomes**

Upon completion of the course, students are expected to be able to:

* Understand the fundamental aspects of cloud application development.
* Develop and deploy Microservices for cloud.
* Build APIs for cloud service providers
* Follow the DevOps practices for software development.
* Build application pipelines using the CICD model.

**Unit 1: Cloud Based Applications**

* Traditional Software vs Cloud Based Software
* Understanding Cloud Ecosystem (SaaS and PaaS)
* Public vs Private Cloud Apps
* Building Scalable and Resilient Applications
* Load balancing and auto-scaling
* Fault tolerance and high availability

**Unit 2: Implementing Micro services**

* Microservices architecture principles
* Serverless computing concepts
* Client to microservices communication
* Interservice communication
* microservices hosting platform options

**Unit 3: Introduction to APIs**

* Introduction: API economy, APIs in public sector.
* API Strategy and Architecture: API Strategy, API value chain, API architecture, API management.
* API Development: Considerations, Standards, kick-start API development, team orientation.
* API Gateways: API Gateways in public cloud, AWS API gateway.
* API Security: Request-based security, Authentication and authorization.

**Unit 4: DevOps Essentials**

* DevOps introduction, Problem and solution.
* DevOps principles and practices
* CI/CD pipeline for cloud applications
* Infrastructure as Code (IaC) and configuration management

**Unit 5: Application Development Frameworks**

* Cloud Application Development Platforms
* Introduction to Application Development Frameworks
* Understanding the MVC architectural pattern
* Testing and Deployment in Frameworks
* Framework selection and best practices

**Text books: -**

1. Building Microservices Applications on Microsoft Azure Designing, Developing, Deploying, and Monitoring — Harsh Chawla Hemant Kathuri
2. https://github.com/indrabasak/Books/blob/master/Kubernetes%20in% 20Action.pdf.
3. Agile Project Management with Azure DevOps: Concepts, Templates, and Metrics 1st ed. Edition, by Joachim Rossberg, Publisher: Apress
4. Rajkumar Buyya, James Broberg, Andrzej Goscinski, *“Cloud Computing Principles and Paradigms”.* Wiley Publishing Inc. 2010.