

Course Curriculum (w.e.f. Session 2023-24)

**B.Tech. (Honors) Computer Science & Engineering**

BCSE0456: DevOps

**Course Objectives:** *The course is designed to provide advance concepts of Version Control Systems, CI, Docker and Container.*

# Credits: 02 L–T–P: 2–0–2

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| **Module No.** | **Content** | **Hours** |
| **I** | **Introduction to DevOps -** Definition and principles of DevOps, Evolution of DevOps, Key benefits and objectives of DevOps, Lifecycle of DevOps.  **Software Development Lifecycle (SDLC) Overview -** Traditional SDLC vs. DevOps approach, Agile methodologies and their role in DevOps.  **Version Control Systems (VCS) -** Introduction to Git, branching strategies and best practices, Git workflows (e.g. Gitflow), merging & stashing.  **Continuous Integration (CI) -** Concepts and importance, setting up CI pipelines with tools like Jenkins, Integrating CI with version control systems. | **16** |
| **II** | **Containerization and Docker -** Understanding containers and Docker, Docker basics: images, containers, and registries, Dockerizing applications, Introduction to Kubernetes, Kubernetes architecture and components.  **Infrastructure as Code (IaC) -** Overview of IaC, Tool: Terraform for infrastructure provisioning, Infrastructure automation best practices.  **Configuration Management -** Introduction to configuration management, Ansible basics and playbook development, Puppet and Chef overview | **16** |

**Text Books:**

* "The Phoenix Project: A Novel About IT, DevOps, and Helping Your Business Win" by Gene Kim, Kevin Behr, and George Spafford
* "Continuous Delivery: Reliable Software Releases through Build, Test, and Deployment Automation" by Jez Humble and David Farley
* "Docker Deep Dive" by Nigel Poulton

# Reference Books:

* "The DevOps Handbook: How to Create World-Class Agility, Reliability, & Security in Technology Organizations" by Gene Kim, Jez Humble, Patrick Debois, and John Willis
* "Kubernetes: Up and Running: Dive into the Future of Infrastructure" by Kelsey Hightower, Brendan Burns, and Joe Beda.
* "Infrastructure as Code: Managing Servers in the Cloud" by Kief Morris

**Outcome:** Upon completion of this course, the students will be able to:

* CO1: Understand the importance of DevOps.
* CO2: Understand branching strategies and best practices for effective collaboration and code management.
* CO3: Understand the concepts and importance of Continuous Integration (CI) in modern software development.
* CO4: Enhancing the knowledge on Dockers, Containers, Kubernetes, etc. in real-world projects.
* CO5: Enhancing the knowledge on, Terraform, etc. in real-world projects.

DEPARTMENT OF COMPUTER ENGINEERING & APPLICATIONS, **Institute of Engineering & Technology**