

Guru Nanak Dev Engineering College, Ludhiana
Department of Information Technology
B. Tech (IT) Scheme 2018
Subject Code: PCIT-115
Subject Name: DevOps: Software Architecture

Programme: B.Tech.	L: 3 T: 1 P: 0
Semester: 6	Teaching Hours: 48
Theory/Practical: Theory	Credits: 4
Internal Marks: 40	Percentage of Numerical/Design Problems: Nil
External Marks: 60	Duration of End Semester Exam(ESE): 3 Hours
Total Marks: 100	Course Type: Professional Core Course

On Completion of the course, the student will have the ability to:

CO#	Course Outcomes
1.	Contrast the various drivers accountable for the surfacing of DevOps
2.	Restate the service delivery process and business benefits
3.	Illustration of most common and popular DevOps tools
4.	Assessment of critical success factors for DevOps implementation
5.	Evaluations of the results with GIT, GITHUB, Jenkins and Dockers
6.	Integration of GITS, Dockers and Jenkins

Prerequisites: Operating System.

Additional Material Allowed in ESE: NIL (Mention anything like graph, calculator etc, if required in exam)

Detailed Contents:

Part-A

DevOps:

Introduction to DevOps - the pillars of the movement, Various Devops Tools, Introduction to Continuous Integration, Continuous Deployment/ Delivery. [10L]

GIT:

GIT Basics, Installing GIT, Working with the Bourne Again Shell (BASH), Using the Graphical User Interface (GUI), GIT Repos, Creating repositories, Staged and unstaged resources, Working with the GIT commit lifecycle, Understanding when to commit, GIT Updates and Tracking, Branching, Working with the Master branch and the HEAD, Working with the commit history, Checking out branches, Building and maintaining new branches, Merging branches, Exploring branch management strategy, Cloning and Remotes, Cloning repositories, Working with remotes, Using Github, Pulling and pushing repositories. [14L]

Part-B

Dockers:

Introduction to containerization, Introduction to Docker, Docker Architecture, Creating your First Container, Checking Connectivity between Containers, Docker Images, Stopping and Removing Containers, Creating Custom Docker Images, Pushing Images to Docker Hub, Using Persistent Storage With Docker, Understanding Docker Networking, Working with Dockerfile, Usage of Docker Compose. [12L]

Jenkins:

Introduction to Jenkins, Jenkins Configuration, Using Jenkins to build projects, Linking Jenkins to GIT repositories, Using Jenkins to set off Docker containerization, Deployment of Docker containers. [12L]

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Text Books:

1. Davis Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton, and Jerome Henry, "IoT Fundamentals – Networking Technologies, Protocols, and Use Cases for the Internet of Things", 5th Impression, CISCO Press, 2020.
2. Mayur Ramgir, "Internet of Things – Architecture, Implementation and Security", 1st Impression, Pearson India, 2020.
3. Raj Kamal, "Internet of Things – Architecture and Design Principles", 5th Reprint Edition, McGraw - Hill Education, 2019.

Reference Books:

1. Adrian Mouat, "Using Docker: Developing and Deploying Software with Containers", 1st Impression, O'Reilly Media, 2016.
 2. Viktor Farcic, "The DevOps 2.1 Toolkit: Docker Swarm", 2nd Impression, Lean Publishing, 2017.
 3. Russ McKendrick, "Docker Bootcamp", 1st Impression, Packt Publishing, 2017.
- Ferdinando Santacroce, "Git: Mastering Version Control", 2nd Impression, Packt Publishing, 2016.

E-Books and Online Learning Material:

1. GIT GUI
<https://git-scm.com/docs/git-gui> Accessed on June 13, 2020
2. DevOps
https://developers.redhat.com/products/rhoar/download?sc_cid=701f2000000Rm8hAAC&gclid=CjwKCAjwLZf3BRABEiwA8Q0qq7Jpr_h4ncsCoF7NmLKSV0V60vrGQNtdt85FdxV5_yFqiZWTCdvbxBoC3l8QAvD_BwE&gclidsrc=aw.ds Accessed on June 13, 2020

Online Courses and Video Lectures:

1. <https://www.udemy.com/courses/search/?q=docker> Accessed on June 13, 2020
2. <https://www.udemy.com/courses/search/?q=devops> Accessed on June 13, 2020
3. <https://www.udemy.com/courses/search/?q=git> Accessed on June 13, 2020
4. <https://www.udemy.com/courses/search/?q=jenkins> Accessed on June 13, 2020