DevOps Syllabus

Lecture-1	**DevOps Fundamentals**
	SDLC lifecycle
	Waterfall Model
	Agile Model
	DevOps
	DevOps vs Traditional IT
	Why and What is DevOps
	Benefits & Lifecycle
	Myths Of DevOps
	DevOps Culture (Collaboration, Feedback Loops)
	Agile, Scrum, and Lean basics
	CALMS model (Culture, Automation, Lean, Measurement, Sharing)
Lecture- 2.1	**Linux & Shell Scripting**
	Linux Basics
	Linux OS fundamentals (file system, permissions)
	Basic commands
Lecture- 2.2	Shell scripting basics (variables, loops, conditions)
	Package managers (apt, yum)
Lecture- 3	**Networking & Security Basics**
	Network layers (OSI/TCP/IP models)
	TCP/IP, DNS, HTTP/HTTPS, Ports, FTP, SSH, ICMP
	Firewalls, Load Balancing, Proxies, VPN
	Subnetting, VPNs, NAT, CIDR, IP addressing, DHCP, routing
	SSL/TLS, encryption, certificates
	Security best practices for infrastructure and DevOps
Lecture-4	**Version Control (Git)**
	Git basics: clone, commit, push, pull
	Branching, Merging, Rebase
	Resolving conflicts
	Git workflows: Git Flow, Trunk-based, Fork-and-PR
	Tags and releases
Lecture-5	**Build Tools**
	Maven or Gradle (Java)
	npm/yarn (Node.js)
	pip (Python)
	Dockerfile basics for packaging
Lecture-6.1	**Containerization (Docker)**
	What is Docker & why use it? Docker architecture (Engine, Daemon, Registry)
	Images vs Containers
Lecture-6.2	Dockerfile creation
Lecture-6.3	Docker Compose
Lecture-6.4	Volume, Networking, Healthchecks

Lecture-7	**Container Orchestration (Kubernetes)** Kubernetes Architecture Kubernetes components (Pod, Node, Cluster, etc.) Deployments, ReplicaSets, Services, Statefulset ConfigMaps & Secrets RBAC (Role-Based Access Control) Volumes, Persistent Storage Helm basics Ingress Controller Monitoring with Prometheus/Grafana
Lecture-8	**CI/CD Pipelines** Concepts: Continuous Integration, Continuous Delivery/Deployment Jenkins / GitHub Actions / Azure DevOps Build pipelines: triggers, stages, jobs Testing and deployment automation Slack/email notifications
Lecture-9	**Infrastructure as Code (IaC)- Terraform and Terragrunt** Providers, Resources, Variables, Outputs, Data, Statefile, tfvars, locals Modules, Remote State, Workspaces Why Terragrunt over Terraform Terragrunt file structure **Ansible** YAML basics Playbooks, Roles, Inventories
Lecture-10	**AWS** VPC, Subnets, EC2 instance, Load Balancer, NACL, Security Groups Elastic IP, Route Tables, RDS, IAM (users,roles,groups,inline policies, managed polici CloudTrail, CloudWatch, EKS, CloudFront(Container Delivery Netwotk=CDN),Auto Sc DynamoDB, MongoDB Atlas, AWS Secret Manager
Lecture-11	**Monitoring & Logging** Prometheus & Grafana ELK Stack (Elasticsearch, Logstash, Kibana) Loki (for logs in Kubernetes) CloudWatch (AWS)
Lecture-12	**Security in DevOps** Secrets management (Vault, K8s secrets) Docker/Kubernetes security best practices IAM roles and policies SonarQube, Trivy, Veracode CI/CD pipeline security
Lecture-13	**Artifact Repository & Package Management**

Versioning strategies
DockerHub, ECR, Harbor

Lecture-14 **Live Project with Best Practices**
Project from scratch