

Site Reliability Engineering

Detailed Course Curriculum





Site Reliability Engineering

Are you in search of an interesting and competitive career that allows you to experience first-hand the full power of Development and Operations — and even go a few steps beyond?

A Site Reliability Engineer Role might be a great fit.

Site reliability engineers create a bridge between development and operations by applying a software engineering mindset to system administration topics.



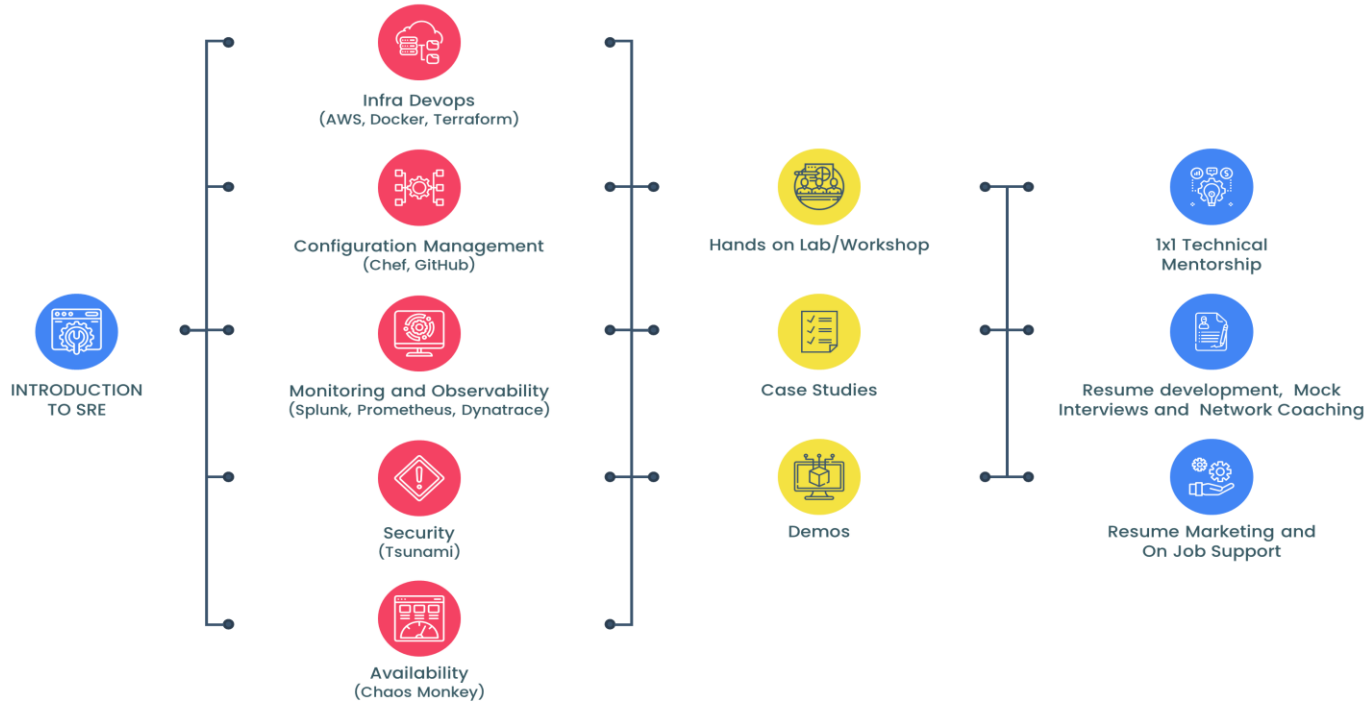
Site Reliability Engineering

Site reliability engineering (SRE) was born at Google in 2003, prior to the DevOps movement, when the first team of software engineers was tasked to make Google's already large-scale sites more reliable, efficient, and scalable. The practices they developed responded so well to Google's needs that other big tech companies, such as Amazon and Netflix, also adopted them and brought new practices to the table.

SRE eventually became a full-fledged IT domain, aimed at developing automated solutions for operational aspects such as on-call monitoring, performance and capacity planning, and disaster response. It complements beautifully other core DevOps practices, such as continuous delivery and infrastructure automation.

Site Reliability Engineering (SRE)

Course Roadmap





Site Reliability Engineering

In the intro session we will talk about the origin and evolution of SRE and try to define what SRE really means. This will set tone for the overall course journey. Emphasis of this module will be on understanding different stages of Development, testing, release, support and good feedback loop.

We will also talk about how SRE is culturally different from the traditional approach to IT

Largely a theory session but we make it fun by having you participate in role play activities to get a solid grip on what being on an SRE team will be like.

- Google Definition
- How Google hires for SRE engineers
- SRE handbooks for reference

Module 1 : What is SRE?

What is Site Reliability Engineering?

- High level explanation of SRE
- Why SRE is in high demand? (number of daily SRE job opening etc.)
- Is it just another operations role?
- Which organizations are hiring SRE engineers specifically?
- Career progression in an SRE role

SRE & DevOps: What is the Difference?

SRE Principles & Practices

Day to Day SRE

- What does a typical day look like?
- Is there a standard tool chain?



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Module 2 : Why SRE?

This module will largely focus on how SRE has transformed IT Operations forever by bringing engineering solutions to operations problems. You will learn about real case studies and examples of organizations that benefited by moving to the SRE operating model.

- Case studies
- Who can be an SRE?
- SRE Testimonials
- SRE Role Transformation



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In this module we will learn the fundamentals of IaC. You will get hands on experience with industry standard tools such as Terraform Server, Provision instances on AWS cloud, setup Docker to understand what it means to create, operate and scale enterprise infrastructure.

We will also perform deep dives on containerization concepts where you will learn how you can help development and UAT teams speed up delivery in the early stages of application development by deploying Docker containers rapidly. Not only will you learn how to operate End-to-End Docker containers, but you will also know how to perform complex analysis and troubleshooting.

Module 3 : SRE - IaC?

Theory Concepts

- What is IaC (Infrastructure as Code)?
- Introduction to DevOps Concepts
- Orchestration tools used in the market today
- Concepts of Immutable Deployments
- What is Desired State Configuration?

Tools/Technologies covered

- Docker
- Amazon Web Services
- Terraform Server



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Configuration Management and Version Control:

Configuration management is an essential skill that every DevOps or SRE must possess in order to be effective. In this module we will cover the fundamentals of configuration management and get our hands dirty using Chef/Puppet and implement solutions for real-life scenarios

We will also briefly touch upon the concepts of version control for code management and re-usability

Module 4 : Configuration Management



Theory

- Configuration management concepts
- Configuration management on the cloud
- Top used tools for CM
- Version control

Tools

- Chef/Puppet
- Git/GitHub

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Monitoring is one of the core non-negotiable skill that every SRE must possess. This module will be broken down into two segments – APM and Log Analytics. You will learn some of the most widely used APM and Log analysis tools in the industry today in a hands-on environment. You will create beautiful visualizations and draw conclusions and provide solutions based on your analysis of the data.

We will also use the tools and data to set and measure goals to measure overall health of applications and services. You will be introduced to concepts of SLI/SLO/SLA and setting error budgets.

Module 5 : SRE Monitoring & Observability

Theory

- Role of monitoring in a complex IT environment
- What does Observability mean?
- Difference types of monitoring
 - Log aggregator v/s APM
 - System Monitoring v/s Application Monitoring
- Choosing the right monitoring solution or tool
- Introduction to Measurements
 - Service Level Indicator
 - Service Level Objective
 - Service Level Agreement
- Understanding Error Budget

Tools

- APM Tools : Prometheus & Dynatrace
- Log Aggregation and Analytics Tool : Splunk



Site Reliability Engineering

Security in Infrastructure and Operations is extremely important for continuity and success of any business. As the world continues to embrace rapid digitization the threat of data breaches grows exponentially. IT Security is increasingly becoming a very sought after yet niche` skill that organizations are looking for in SRE engineers

You will be learning Tsunami Security Scanner with NMAP and NCRACK as utilities for managing security

Module 6 : SRE - Security

Theory

- Why security is so big on every CEO's mind
- Most famous data breaches
- Commonly used tools for security analysis

Tools

- Google Tsunami



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In this module we will learn about why measuring availability is very important for understanding system health. While this module is going to be largely theory, the concepts covered here will enable you to become a well-rounded SRE Engineer

We will also touch upon chaos engineering which is creating waves in the IT world

Module 7 : SRE – Availability and Chaos

Theory

- What is availability
- Significance of 4 Nines of availability (metrics)
- Defining realistic availability goals
- Correlating availability and Customer impact (CSAT / Revenue)
- Introduction to synthetic monitoring
- Introduction to Chaos Engineering
 - Simian Army
 - Circuit Breakers
 - Deliberate Adversity
 - Conducting a successful chaos experiment



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Module 8 : SRE – Closing Notes



In the closing module we will talk about industry trends, upcoming tools, job market and practically anything under the sun as long as it pertains to the world of SRE.

Guidelines

HANDS-ON LABS VS. THEORY RATIO

- Approximately 3:1

Prerequisites

While the course is structured to cater to anyone who has worked in the IT industry the following skills are nice to have – not mandatory

- Basic Linux/UNIX commands
- Creating/editing text files in vi or a text editor
- Standard Shell scripting and/or C



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Knowledge

- Complete knowledge of SRE Foundations and Culture
- Ready to apply hands-on knowledge of some of the most commonly used DevOps tools
- Participants will be able to confidently approach operations problems with an SRE/DevOps mindset
- Participants will be able to have an IT Ops transformation conversation with their leadership
- Participants will have high level of confidence while facing an SRE job interview

SRE – Training Outcome

Tools

Following Tools will be used:

- Version Control System - GIT, GITHUB
- IaC - Terraform
- Configuration Management - Puppet, Chef
- Containerization - Docker
- Monitoring - Prometheus, Dynatrace
- Log Analysis - Splunk
- Security - Tsunami

Site Reliability Engineering

Instructor Profile



Sagar Mehta

With over 15+ years of experience in DevOps/SRE implementation and training in large enterprises such as VMware, Intel, Barclays, Wells Fargo, Vodafone, JPMC and 25 others, Sagar is one of the most experienced Site reliability engineering and DevOps trainers in the world today. He has delivered over 150+ Programs on essential tools such as Puppet, Chef, Ansible and 100+ programs on DevOps/SRE Foundations.

Sagar has performed hands-on DevOps/SRE implementation at several large organizations and transformed the way IT ops is done. He influenced all 3 critical pillars of change - people process and technology to effect this transformation.

Sagar is also very passionate about coaching people and sharing his wealth of knowledge, he takes time to personally help his students navigate through challenges in the tech world through 1x1 mentoring sessions.



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