TOC

Day	Topics	Hands-on / Deliverables
Week 1		
Day 1	**Product Engineering mindset** - Introduction to Product Use Case (30 min) - Understanding Epics & Stories (60 min) - Customer-centric metrics (60 min) - Defining MVP & iterations (90 min +)	- Write 3/4 user stories & acceptance criteria - Define metrics for success (latency, application uptime, etc.) - Create product backlog in Jira
Day 2	**Requirements for High-Level Design** - UML diagrams (use case, sequence, class)(120 min) - ER diagrams for data model (120 min) - API specs planning (Swagger) (120 min)	- Draw high-level architecture - Design DB schema for key entities - Draft REST endpoints
Day 3	**Core Python & OOP Principles** - SOLID, DRY, KISS principles (120) - Pydantic Models vs. ORM Models (120) - Dependency Injection Concepts in Python (120 min)	- Create Pydantic models (for data transfer) & SQLAlchemy ORM models (for database entities) for the use case. - Implement basic services with built-in Dependency Injection in FastAPI.
Day 4	**FastAPI Fundamentals** - Routers, Services, and the Repository Pattern (analogous to Controllers, Services, Repositories) - SQLAlchemy ORM basics - Configuration management (e.g., using Pydantic settings) **Testing Strategies & CI Basics** - Pytest & unittest.mock - Basic Jenkinsfile	- Implement **CRUD endpoints** for the first story using FastAPI and SQLAlchemy. - Generate automatic **Swagger/OpenAPI documentation** with FastAPI. - Write unit tests for services using **Pytest**. - Configure a Jenkins Job for the Python application.
Day 5	**API Design Practices** - REST conventions & versioning - Pagination, filtering, sorting - Proper HTTP status codes & error handling	- Implement GET with filters for available slots - Implement global exception handler
Week 2		
Day 6	**Secure Coding Practices** - OWASP 10 (SQLi, XSS, Broken Auth) - Input validation, parametrised queries	- Implement SQL injection-safe search API - Add Pydantic validation on API inputs
Day 7	**Authentication & Authorization** - JWT-based auth - Different Authentication Schemes - Authentication & Authorization Flow	- Add login API with JWT - Restrict Admin endpoints
Day 8	**Transactions Flow** - Transaction flow in Python (FastAPI, SQLAlchamey)	- Implement create budget API (mock) - Generate financial report

	- External service integrations - AOP using Decorator - FastAPI Exception handling	
Day 9	**Async Processing** - Event-driven architectures - FastAPI @Async, messaging basics	- Create an endpoint to receive some async events - Process updates asynchronously
Day 10	**Testing Strategies** - Integration tests with Testcontainers	- Write integration tests for booking flow
Week 3		
Day 11	**Productionization Considerations** - Environment profiles (dev/stage/prod) - 12 Factor App principles - Config management - Connection pooling & caching	- Implement Spring profiles -
Day 12	**Observability & Support** - Centralised Logging - Logging best practices - Metrics instrumentation (Micrometer, Prometheus, X-ray) - Health checks & alerts	- Implement /actuator/health - Add request/response logging - Adding metrics for endpoints
Day 13	**Cloud Basics** - IAM - FIL Cloud Setup - Compute Resources (EC2, ECS, Lambda) - Storage (S3, EBS, EFS) - Networking (VPC, Subnet, Security Group, Endpoints, Internet Gateway, NAT Gateway) - Databases (RDS, DynamoDB) - CloudWatch, CloudTrail, KMS, AWS Secrets - API Gateway, Route53 - Load Balancer - Understanding Access from the FIL network	- AWS console Tour - Launching an EC2 Instance and connecting to it - Deploying a basic Lambda function, configuring CloudWatch and setting up CPU utilisation alarms for the EC2 instance
Day 14	**CI/CD Basics** - Understanding basic DevOps Terms o Continuous Integration o Continuous Delivery o Continuous Deployment - FIL DevOps Tools o GitHub Action o Jenkins o Nexus o SonarQube o Harbor	- Configuring the template for standard CI Pipeline design o Commit Pipeline o Acceptance Pipeline o Release Pipeline
Day 15	**GitHub Action** - Basic Architecture	- Implementing the Commit Pipeline in GitHub Actions

	- Self-Hosted Runner in FIL - Action Workflows - Jobs, steps, trigger - Matrix Build Concept - Managing Secrets - Troubleshooting and debugging - FIL specific practices	
Week 4		
Day 16	**Jenkins** - Jenkins Architecture (FIL Setup) - Jenkinsfile Constructs - Jenkins CI/CD Agents - Managing secrets - Troubleshooting and debugging - Shared Libraries (FIL Shared Libraries) - Compliance Enforcement (FIL specific)	- Implementing Commit Pipeline in Jenkins - Implementing Acceptance and Release Pipeline in Jenkins
Day 17	**FIL Terraform Assets** - Terraform Concepts o IaC Concepts o Providers, Resources, State, Variables, Output o Workspace o Backends o Managing secrets in Terraform - FIL Innersource Repository o Walkthrough of Important modules, structure o Contribution mode to innersource repository	- Bootstrapping AWS accounts - Configuring Use case specific resources using Terraform module - Provisioning Lambda & ECS service
Day 18	**Provisioning Resources Using IaC** - Docker Overview - Configuring the deployment resources using Terraform	- Configuring Release Pipeline on Jenkins
Day 19	- Functional Testing - Performance Testing	- Configuring Acceptance Pipeline on Jenkins
Day 20	**To Be Filled up**	-
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