FastAPI Mastery Roadmap (Industry-Ready)

A complete, production-focused roadmap to master FastAPI backend development.

Phase 0: Python Foundations

- Python syntax, data types, and control flow
- Type hints and typing module
- Async / await basics
- Virtual environments and dependency management

Phase 1: HTTP & Web Fundamentals

- HTTP methods and status codes
- Headers, cookies, query & path parameters
- REST principles and stateless APIs
- JSON serialization and idempotency

Phase 2: FastAPI Core

- FastAPI app initialization
- APIRouter and API versioning
- Request/response handling
- Response models and status codes

Phase 3: Pydantic

- BaseModel and field validation
- Optional vs required fields
- Custom validators
- Schema separation (Create, Read, Update)

Phase 4: Dependency Injection

- Depends() basics
- Reusable dependencies
- Database session dependency
- Authentication dependencies

Phase 5: SQLAlchemy (Industry Core)

- Engine, Session, and Declarative Base
- Models and relationships
- CRUD operations and queries
- Transactions and migrations

Phase 6: Clean Architecture

- Controller, Service, CRUD layers
- Separation of concerns
- DTO mapping and naming conventions

Phase 7: Error Handling

- HTTPException
- Custom exception handlers
- Validation and database errors

Phase 8: Authentication & Security

- JWT authentication
- OAuth2 flows
- Password hashing
- Role-based access control

Phase 9: Async & Background Tasks

- Async routes
- Background tasks
- WebSockets

Phase 10: Middleware & Lifecycle

- Custom middleware
- Startup and shutdown events
- Lifespan management

Phase 11: Testing

- Pytest and TestClient
- Unit and integration tests
- Dependency overrides

Phase 12: Performance & Optimization

- N+1 problem
- Indexing and query optimization
- Caching with Redis

Phase 13: Documentation & API Design

- OpenAPI and Swagger
- Pagination and versioning
- Error response standards

Phase 14: Deployment & DevOps

- Environment variables
- Docker and Docker Compose
- CI/CD basics

Phase 15: Advanced Backend Concepts

- Microservices
- Message brokers
- Observability and monitoring

Outcome: You will be production-ready for backend roles using FastAPI.