

VERSION

25

**TESBO COURSE**

ELYSIUM  
ACADEMY  
TESBO FULL  
STACK CORE  
PROGRAMMER

**ELYSIUM  
ACADEMY**

**TESBO FULL  
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PROGRAMMER**

ELYSIUM  
ACADEMY

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STACK CORE  
PROGRAMMER

**SR. CODE**

EAPL/TESBO/TSTC02

**COURSE CODE**

EATFC

**SUB CATEGORY**

FULL STACK DEVELOPMENT

  
TOTAL DURATION  
**180**  
HOURS

  
THEORY TAKEN  
**60**  
HOURS

  
PRACTICAL TAKEN  
**120**  
HOURS



## COURSE DESCRIPTION



This Web Programming with Python course takes you through a hands-on guide to object-oriented python web programming, working with multiple types of servers, databases and web frameworks. All that is required to get started is a very basic background knowledge of Python Multiple chapters of review and then goes step by step through the necessary concepts at every stage of development.

## COURSE GOALS



You'll get a detailed primer on database programming with Python, installing an SQLite server and performing routine data selections and operations; you'll learn how to interact with FTP and email services using native Python code; see how to process web form data via Python; and learn how to interact with web database applications and utilize XML.

## FUTURE SCOPE



Finally, the Python web programming course ends with a chapter on configuring and working with Django and Flask a modern web framework that allows you to create and manage complex database-driven websites.



## FRONT END TECHNOLOGIES

# 01

## CHAPTER

### HTML

#### O1. HTML Overview

- HTML Editing Tools
- Document Structure
- HTML Tags
- Information browsers ignore
- Specifying Color in HTML

#### O2. Structural HTML Tags

- Setting up an HTML document
- Using Tags
- Formatting Text
- Introduction to frames

#### O3. Adding images and other page elements

- Horizontal rules
- The Image basics
- The IMG tag and its attributes
- Media queries

#### O4. Tables

- Introduction to tables
- Affecting table appearance
- Table troubleshooting
- Standard table templates
- Multipart images in tables

#### O5. Forms

- The basic form (FORM)

  
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- b. The FORM elements
- c. The New FORM attributes (HTML 4.0)
- d. Affecting the appearance of forms
- e. Unconventional use of FORM elements

## **O6. Server Side includes (SSI)**

- a. How SSI is used
- b. The SSI and the server
- c. Adding SSI commands to a document
- d. Using environment variables

# 02

## CHAPTER

### **CSS**

#### **O1. Basic styling of web pages using**

- a. Concept of CSS
- b. Creating Style Sheet
- c. CSS Properties

#### **O2. Manipulate the display & position of HTML elements**

- a. Setting up the initial HTML and CSS files
- b. Using the inline block value
- c. Changing a Table to Use a Display block
- d. Adding Small screen content Element

#### **O3. Understand the Box Model concept**

- a. Introduction,
- b. Border properties,
- c. Padding Properties,
- d. Margin properties





## **O4. Design mobile friendly web pages using CSS Media Queries**

- a. RWD Introduction
- b. RWD Viewport
- c. RWD Gridview
- d. RWD Media Queries
- e. RWD Images
- f. RWD Videos
- g. RWD Frameworks
- h. RWD Templates

## **O5. Animate HTML elements using CSS animate property**

- a. CSS Animation
- b. CSS Animation property
- c. Delay an Animation
- d. Run Animation in reverse Direction or Alternate Cycles
- e. The speed curve of the Animation
- f. The fill-mode of an Animation

## **O6. Web page Layouts - CSS Flex Box & CSS Grid**

- a. How to Build the Navigation Bar
- b. How to Build the Showcase Section
- c. How to Build the Lower Section
- d. How to Build the Footer Section
- e. How to Make the Page Responsive



# 03

## CHAPTER

### **BOOTSTRAP**

#### **O1. The Grid Layout**

- a. Grid System
- b. Stacked/Horizontal
- c. Grid small
- d. Grid large
- e. Grid medium
- f. Grid XXL

#### **O2. Buttons and Dropdowns**

- a. Adding Dropdowns via Data Attributes
- b. Dropdown within a navbar
- c. Dropdowns within button
- d. Bootstrap Split button dropdown
- e. Dropdowns inside Button Groups
- f. Creating Dropup, Dropleft and Dropright Menus
- g. Creating the Right Aligned Dropdown Menus
- h. Adding Headers to Dropdown Items
- i. Disable Items within a Dropdown
- j. Adding Dropdowns via JavaScript
- k. Methods – toggle, show, hide, update, dispose, Events

#### **O3. Navigation bar**

- a. Adding Logo images to Navbar
- b. Adding Dropdown to Navbars
- c. Placing search from inside Navbar
- d. Creating the color scheme for Navbars
- e. Bootstrap fixed Navbar
- f. Creating Navbar with Bootstrap



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## O4. Images and media

- a. Styling images with bootstrap
- b. Creating Responsive images and videos
- c. Horizontal alignment of images
- d. Using the media object
- e. Creating Nested media object

# 04

CHAPTER

## JAVA SCRIPT

### O1. JavaScript in Web browser

- a. Embedding JavaScript in HTML
- b. Execution of JavaScript code

### O2. Browser Object Model

- a. The window object
- b. Dialog boxes
- c. Timers
- d. The location object
- e. The navigator object
- f. Browsing history

### O3. Document Object Model

- a. Document structure
- b. Selecting document elements and query selectors
- c. Moving thorough DOM tree
- d. HTML elements and attributes
- e. Creating, changing and deleting nodes

### O4. Handling Events

- a. Event propagation



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- b. Event handlers registering and invocation
- c. Event object
- d. Types of event

## **O5. Ajax**

- a. JavaScript and HTTP communication
- b. Synchronous and asynchronous requests

## **O6. Graphics**

- a. Multimedia basics
- b. Canvas API basics

## **O7. Data Storage**

- a. Cookies,
- b. Web Storage,
- c. IndexedDB

## **O8. Security**

- a. Filesystem security
- b. The Same Origin Policy
- c. Plugins
- d. Cross-Site Scripting

# 05

**CHAPTER**

## **JQUERY**

### **O1. JQuery Basics**

- a. Introduction
- b. JQuery Syntax
- c. JQuery Selectors

### **O2. JQuery Events**



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### **O3. JQuery Effects**

- a. JQuery Hide/Show
- b. JQuery Fade
- c. JQuery slide
- d. JQuery Stop()
- e. JQueryCallback()

### **O4. JQuery HTML**

- a. JQuery Get/Set
- b. JQuery Add/Remove
- c. JQuery CSS Classes

### **O5. Hosting First Website**

- a. Web Hosting Basics
- b. Types of Hosting Packages
- c. Registering domains
- d. Defining Name Servers
- e. Using Control Panel
- f. Creating Emails in Cpanel
- g. Using FTP Client

## **BACK END TECHNOLOGIES**

# **06**

**CHAPTER**

### **BASICS**

#### **O1. Introduction**

- a. Overview
- b. Environmental setup



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## **O2. Coding Instruction**

- a. Installation procedure
- b. Different ways to write a python program
- c. Execution steps and process
- d. Understanding a simple program
- e. Program execution flow
- f. Python Virtual Machine
- g. Examples

## **O3. Variables**

- a. What is a variable?
- b. Properties of variable
- c. Creating variable
- d. Invalid cases for variables
- e. Multiple variables in n single line
- f. Single value for multiple
- g. Variable re-initialization

## **O4. Data types**

- a. What is data type?
- b. Different types of data types
- c. Built-in data types
- d. Sequences
- e. Accessing range values
- f. User-defined data types
- g. Converting from one data type into
- h. Another data type

## **O5. Operators**

- a. What is an operator?



- b. Different type of operators
- c. Arithmetic Operators
- d. Assignment operator
- e. Unary minus operator
- f. Relational operators
- g. Logical operators
- h. Membership operators
- i. Identity operators

## **O6. Control Flow statement**

- a. What is Flow control?
- b. Sequential flow
- c. Conditional flow
- d. Looping flow
- e. Sequential statements
- f. Conditional or Decision-making statements
- g. If statement
- h. If else statement
- i. If elif else statement

## **O7. Looping statements**

- a. What are Looping Statements?
- b. While and for loop
- c. Where loops with else block flow are helpful?
- d. Break statement
- e. Continue statement
- f. Pass statement
- g. The return statement

## **O8. Strings**

- a. What is a string



- b. What is Slicing?
- c. What is Immutable?
- d. Strings are immutable
- e. Mathematical operators on string objects

# 07

## CHAPTER

### **FUNCTION, MODULE & PACKAGES**

#### **O1. Types of Function argument**

- a. Positional Arguments
- b. Keyword Arguments
- c. Default Arguments Function
- d. Variable Length Arguments
- e. keyword variable-length argument
- f. Function vs Module vs Library

#### **O2. Types of variables**

- a. Types of Variables
- b. Local Variables
- c. Global variables
- d. Global Keyword

#### **O3. Recursive and Lambda Functions**

- a. Recursive Function in Python
- b. Lambda Function (Anonymous Functions) in Python
- c. Filter() function in Python
- d. Map() function in Python
- e. Reduce() function in Python



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## O4. Decorators and Generators

- a. Decorators in Python
- b. @ symbol in python
- c. Generators in Python
- d. Next function in Python

## O5. Modules and packages

- a. What is a module?
- b. Renaming or aliasing a module
- c. dir() function
- d. What is a package?
- e. Advantage

# 08

## CHAPTER

## **DATABASE HANDLING**

### O1. MySQL database Access

- a. Create Database Connection
- b. DML and DDL Operation with database
- c. Performing transactions
- d. Handling database Errors
- e. Disconnecting Database

### O2. Database Connection with NOSQL DB

- a. SQL vs NOSQL
- b. MongoDB
- c. PyMongo
  - SQL vs NOSQL
  - MongoDB
  - PyMongo



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# 09

## CHAPTER

## OBJECT ORIENTED PROGRAMMING

### O1. Constructors

- What are Constructors
- Is constructor mandatory in Python?
- Can a constructor be called explicitly?
- How many parameters can constructor have?
- Parameterised and Non-Parameterized Constructors in Python
- Difference between a method & constructor in Python
- Difference between a method & a function

### O2. Types of Class variable

- Types of Class Variables
- Instance Variables
- Where instance variables can be declared?
- Accessing instance variables
- Static Variables
- Declaring static variables
- Accessing a static variable
- Local Variables

### O3. Types of Class Method

- Types of Methods in a Class
- Instance Methods
- Setter and Getter methods
- Class Methods
- Static Methods
- Nested Classes
- Garbage Collection



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## **O5. Polymorphism**

- a. Polymorphism
- b. Types of Polymorphism
- c. Overloading
- d. Operator overloading
- e. Method overloading
- f. How we can handle overloaded method requirements
- g. Constructor Overloading
- h. Overriding
- i. Method Overriding
- j. Constructor Overriding

## **O6. Abstract classes**

- a. What is an Abstract Class in Python?
- b. Types of Methods in Python based on the Implementation
- c. How to declare an abstract method in Python
- d. Abstract Classes in Python
- e. Interface



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## CHAPTER

## **EXCEPTION HANDLING & FILES**

### **O1. Exception Handling**

- a. Types of Error
- b. Syntax and Runtime Errors
- c. What is an Exception?
- d. Exception Handling in Python

### **O2. Finally Block**

- a. Why do we need Finally Block?
- b. Finally Block in Python
- c. Why not 'try except' block for clean-up activities?
- d. Different control flow cases of try except finally in python

### **O3. Nested try-except-finally blocks**

- a. Nested try-except-finally blocks in Python
- b. Different cases and scenarios
- c. Else Block in Python
- d. Possible Combinations with
- e. try-except-else-finally

### **O4. Files**

- a. What is a File?
- b. Types of Files
- c. File Modes
- d. Opening and Closing a File
- e. Properties of File Object
- f. Writing data to a File
- g. Reading data From a File
- h. With Keyword



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## CHAPTER

## MULTITHREADING

### O1. Introduction

- What is Multitasking?
- Process based and Thread based Multitasking
- Applications of Multithreading
- How to implement Multithreading?
- Different Ways to Create a Thread
- Creating a Thread using Thread class
- Creating a Thread class by inheriting Thread class

### O2. Methods of Thread Class

- `active_count()`
- `enumerate()`
- `isAlive()`
- `join()`
- `join(seconds)`

### O3. Synchronization

- Synchronization
- How to implement synchronization?
- Synchronization By using Lock concept
- Synchronization By using RLock concept
- Difference between Lock and RLock
- Synchronization by using Semaphore
- Bounded Semaphore



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## O4. Inter Thread Communication

- a. What is Inter Thread communication?
- b. Inter Thread communication by using Event Objects
- c. Inter Thread communication by using Condition Object
- d. Inter Thread communication by using Queue in python
- e. Types of Queues
- f. FIFO Queue
- g. LIFO Queue
- h. Priority Queue

## WEB BASED PYTHON FRAMEWORK

# 12

CHAPTER

## DJANGO FRAMEWORK

### O1. Djangoframwork

- a. Introduction to Django
- b. How to create Django App
- c. Url |Mapping
- d. Templates
- e. Introduction to static file
- f. Django Model overview
- g. Creating model



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- h. Model Template view creation
- i. Django Form and validation
- j. Relative URL with Templates

## **O2. Django Administration site**

- a. Activating the admin interface
- b. Using the admin interface
- c. Users, Groups and permission

## **O3. Form Processing**

- a. Django Forms
- b. Form Validation
- c. Model form
- d. Relative URLs with Templates

## **O4. Views and Templates**

- a. URL templates Inheritance
- b. Quick note on Custom templates Filter
- c. Template Filters and Custom Filters
- d. Django Passwords
- e. Deploying Django Framework

## **O5. Interacting with a Database**

- a. Overview of models
- b. Creating model
- c. Configuring the database
- d. Your First App
- e. Using Django with MySQL
- f. Population Script
- g. Models-Templates-Views Paradigm
- h. Inserting and Updating data



- i. Selecting Object
- j. Deleting Object

## **O6. Working with Sessions**

- a. Get Session
- b. Set session
- c. Session Attributes
- d. Methods in Session

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CHAPTER

## **FLASK WEB FRAMEWORK**

### **O1. Web Framework**

- a. What is a Flask?
- b. WSGI
- c. Werkzeug
- d. Jinja2

### **O2. Installation and Environmental Setup**

- a. Prerequisite
- b. Install Flask on window
- c. Code Structure of flask framework
- d. In-Built Server of flask
- e. Add to System path
- f. Configure in IDE

### **O3. Create Basic first Application**

- a. How a Flask App works
- b. Routing and View Functions
- c. Server startup
- d. Basic app object





## **O4. Templates**

- a. Jinja2 template Engine
- b. Rendering Templates
- c. Variables
- d. Control Structures
- e. Flask-Bootstrap
- f. Custom Error Pages
- g. Creating HTML Templates
- h. Adding more HTML pages
- i. Links
- j. Static files
- k. Localization of Dates and Time with Flask-Moment

## **O5. Web Forms**

- a. CSRF Protection
- b. Form classes
- c. HTML rendering of Forms
- d. Form handling in View Functions
- e. Redirect and User Sessions
- f. Message Flashing

## **O6. Database**

- a. SQL or NoSQL
- b. Flask-SQLAlchemy
- c. Model Definition
- d. Relationships
- e. CRUD Operations
  - SQL or NoSQL
  - Flask-SQLAlchemy



- Modifying Rows
- Deleting Rows
- Querying Rows
- f. Database use in View function
- g. Flask-Migrate

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## CHAPTER

### **CHERRYPY**

#### **O1. Introduction**

- a. Environmental Setup
- b. Built – in Http Server

#### **O2. Tool box**

- a. Caching Tool
- b. Decoding Tool

#### **O3. Working Application**

#### **O4. Web services**

- a. Authentication
- b. Authorization
- c. Structure
- d. Encapsulation
- e. Error Handling

#### **O5. Presentation layer**

#### **O6. Use of Ajax**

#### **O7. Demo Application**

#### **O8. Web services**

- a. Unit Testing
- b. Functional testing
- c. Load Testing

#### **O9. Deployment of Application**





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## CHAPTER

### **INTRODUCTION TO JAVA**

- O1. Keywords, Variables and Operators.
- O2. Data Types.
- O3. Java String Basics.
- O4. Type casting.
- O5. Operators
- O6. Arrays
- O7. Java Statements
- O8. Java Methods
  - a. Java Method Parameters
  - b. Java Method Overloading
  - c. Java Scope
  - d. Java Recursion



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## CHAPTER

### **JAVA CLASSES**

- O1. OOPs
- O2. Classes/Objects
- O3. Class Attributes
- O4. Class Methods
- O5. Modifiers
- O6. Encapsulation
- O7. Packages
- O8. Inheritance



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O9. Polymorphism  
10. Abstraction  
11. Interface  
12. Enums

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CHAPTER

## JAVA WEB APPLICATION TECHNOLOGIES

### O1. Java List

- a. Java Date
- b. LinkedList
- c. HashMap
- d. HashSet
- e. Iterator

### O2. Java Exceptions

### O3. Java RegEx

### O4. Java Threads

### O5. Java File Handling

- a. Explanation
- b. Create/Write Files
- c. Read Files
- d. Delete Files



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## JAVA WEB APPLICATION TECHNOLOGIES

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CHAPTER

### **SERVLET**

#### O1. Servlet API

- a. Servlet Interface
- b. Http Servlet
- c. War File

#### O2. Servlet with IDE

#### O3. Servlet Request

#### O4. Servlet Collaboration

#### O5. ServletConfig

#### O6. ServletContext

#### O7. Attribute in Servlet

#### O8. Session Filter

#### O9. Servlet CRUD

#### 10. Servlet Pagination

#### 11. Servlet Miscellaneous

#### 12. Development



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CHAPTER

### **JSP(JAVA SERVER PAGE)**

#### O1. JSP Introduction

#### O2. JSP Basics

- a. JSP-Scripting Elements
- b. JSP- Directives
- c. JSP-Actions
- d. JSP-Expressions



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## O3. JSP Implicit Objects

- a. JSP-Implicit Objects
- b. JSP-Request
- c. JSP-Response
- d. JSP-Session
- e. JSP-Exceptions

## O4. JSP-JSTL

## O5. JSTL Core Tags

## O6. JSP Advanced

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CHAPTER

## **JDBC API**

### O1. JDBC Drivers

### O2. Connections

### O3. Statements

- a. Prepared Statements
  - Create
  - Select
  - Update
  - Insert

### O4. Result Sets



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# 21

## CHAPTER

### SQL

#### O1. Data Query Language

- a. What is DQL?
- b. Purpose of DQL
- c. Select

#### O2. Data Manipulation Language

- a. What is DML?
- b. Purpose of DML
- c. Insert data
- d. Update data
- e. Delete Data
- f. Lock data

#### O3. Data Control Language

- a. What is DCL?
- b. Purpose of DCL
- c. Grant data
- d. Revoke data

#### O4. Transaction Control Language

- a. What is TCL?
- b. Purpose of TCL
- c. COMMIT
- d. ROLLBACK
- e. SAVEPOINT

#### O5. Inserting data

- a. Hands on INSERT data
- b. SELECT



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- c. Hands on SELECT query
- d. Multi inserts
- e. Hands on Multi inserts
- f. NOT NULL
- g. Hands on NOT NULL
- h. DEFAULT Values
- i. Hands on DEFAULT Values
- j. AUTO INCREMENT
- k. Hands on AUTO INCREMENT

## **O6. Basic Operators**

- a. ORDER BY
- b. ALIASES
- c. UNIONS
- d. CONSTRAINTS
- e. VIEWS

## **O7. Primary Key**

- a. What is primary key?
- b. Creating a primary key
- c. Dropping a primary key

## **O8. Foreign key**

- a. What is foreign key?
- b. Creating a foreign key
- c. Dropping a foreign key



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## CHAPTER

### O1. Introduction

- a. Getting the required libraries for hibernate.
- b. Creating a hibernate persistent class.
- c. Providing an XML- based hibernate mapping.
- d. Providing an annotation-based hibernate mapping.
- e. Providing a hibernate configuration using an XML file.
- f. Providing a hibernate configuration using the file properties.
- g. Configuring hibernate programmatically.

### O2. Understanding the Fundamentals

- a. Introduction.
- b. Building a session factory.
- c. Creating a generic session factory provider class.
- d. Opening a new session.
- e. Opening a stateless session.
- f. Saving an object to the database.
- g. Fetching an object from the database.
- h. Removing an object from the database.
- i. Updating an object.



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- j. Creating a criteria.
- k. Restricting the results using a criteria.
- l. Pagination using a criteria
- m. Sorting the result.
- n. Transforming a result.
- o. Using basic projection.

### **O3. Basic Annotations**

- a. Introduction.
- b. Declaring a class as an entity and creating a table in the database-@Entity and @Table.
- c. Creating a column in the table-@Column.
- d. Creating the primary key and composite primary key Column-@Id and @Id Class.
- e. Creating an auto generator column.

### **O4. Working with Collections**

- a. Introduction.
- b. Persisting list.
- c. Persisting set.
- d. Persisting map.
- e. Persisting array.



## O5. Working with Associations

- a. Introduction.
- b. One-to-One mapping using foreign key association.
- c. One-to-One mapping using a common join table.
- d. One-to-One mapping using a common primary key.
- e. One-to-One mapping or Many-to-One mapping.
- f. Many-to-Many mapping.

## O6. Querying

- a. Introduction.
- b. Working with an alias.
- c. Performing aggregate operations.
- d. Executing a sub query using a criteria.
- e. Executing a native SQL query.
- f. Executing a query using HQL.
- g. Using formula in hibernate.
- h. Working with Named Query.



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CHAPTER

## GETTING STARTED

- a. What is spring?
- b. Setting up your system
- c. Introducing Maven
- d. Using Maven on the command line
- e. Class path contexts.



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CHAPTER

## BASIC BEAN CONFIGURATION

- a. Setting bean Properties
- b. Constructor Arguments
- c. Dependency Injection
- d. Bean Scope
- e. Factory Beans and Methods
- f. P Namespaces
- g. List of Beans



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CHAPTER

## AUTO WIRING

- a. Autowiring by type
- b. Autowiring by name
- c. Autowiring by constructor
- d. Default Autowiring
- e. Removing autowire Ambiguities



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CHAPTER

## WIRING WITH ANNOTATIONS

- a. "Autowired" Annotation
- b. Optional Beans
- c. Using Qualifiers
- d. Annotation- Based Init and Destroy Methods
- e. Setting property values via Annotation



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CHAPTER

## SPRING EXPRESSION LANGUAGE (SPEL)

- a. Introduction SPEL
- b. Using SPEL with Annotation
- c. Some useful SPEL operators



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CHAPTER

## WORKING WITH DATABASES

- a. Creating database with Mysql
- b. Implementing DAO Pattern
- c. Downloading connection jar
- d. Configuring connection with Apache
- e. JDBC Templates
- f. Querying Database (CRUD Operations)
- g. Transactions with prepared statements



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## CHAPTER

### WEB APPLICATIONS WITH SPRING MVC

- a. Maven Concepts
- b. Bringing in Maven
- c. Dispatcher servlet
- d. Adding data to the session
- e. Bringing in DAO code and controllers

  
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# 30

## CHAPTER

### ASPECT ORIENTED PROGRAMMING (AOP)

- a. Annotation based aspects
- b. Wildcards in pointcut expressions
- c. Advice types after, around, etc
- d. Proxies
- e. Point cuts

  
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## CHAPTER

### SPRING WEB FLOW

- a. Introducing web flow
- b. Flow registry
- c. Hooking up URLs
- d. Messages
- e. Validating web flow forms

  
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