

## Database Foundations – Course Description

### Overview

This course introduces students to basic relational database concepts. The course teaches students relational database terminology, as well as data modeling concepts, building Entity Relationship Diagrams (ERDs), and mapping ERDs. [Oracle SQL Developer Data Modeler](#) is utilized to build ERDs and The Structured Query Language (SQL) is used to interact with a relational database and manipulate data within the database. [Oracle Application Express](#) is utilized to provide practical, hands-on, engaging activities. Leveraging project-based learning techniques, students will create and work with projects which challenge them to design, implement, and demonstrate a database solution for a business or organization.

### Available Curriculum Languages:

- Arabic, Simplified Chinese, English, French, Indonesian, Japanese, Brazilian Portuguese, Russian, Spanish

### Duration

- Recommended total course time: 90 hours\*
- Professional education credit hours for educators who complete Oracle Academy training: 30

*\* Course time includes instruction, self-study/homework, practices, projects and assessment*

### Target Audiences

#### Educators

- Technical, vocational and 2- and 4- year college and university faculty members who teach computer science, information communications technology (ICT), data science, business or a related subject
- Secondary and vocational school teachers who teach computer science, ICT, or a related subject

#### Students

- Students who wish to learn the techniques and tools to design, build and extract information from a database
- Students who possess basic mathematical, logical, and analytical problem-solving skills
- Novice programmers, as well as those at advanced levels, who prefer to start learning the basis for the SQL programming language at an introductory level
- This foundational course is suitable for computer science majors and non-majors alike

### Prerequisites

#### Required

- General knowledge of the purpose of a database

#### Suggested

- Previous experience with a database application

### Suggested Next Courses

- Database Design and Programming with SQL

## Lesson-by-Lesson Topics

### Introduction

- Introduction to the Course
- Introduction to Databases
- Types of Database Models
- Business Requirements

### Databases and Data Modeling

- Relational Databases
- Conceptual and Physical Data Models
- Entities and Attributes
- Unique Identifiers
- Relationships
- Entity Relationship Modeling (ERDs)

### Refining the Data Model

- More with Relationships
- Tracking Data Changes
- Normalization and Business Rules
- Data Modeling Terminology and Mapping

### Oracle SQL Developer Data Modeler

- Oracle SQL Developer Data Modeler
- Convert a Logical Model to a Relational Model

### Mapping to the Physical Model

- Mapping Entities and Attributes
- Mapping Primary and Foreign Keys

### Introduction to SQL

- Introduction to Oracle Application Express
- Structured Query Language (SQL)
- Data Definition Language (DDL)
- Data Manipulation Language (DML)
- Transaction Control Language (TCL)
- Retrieving Data Using SELECT
- Restricting Data Using WHERE
- Sorting Data Using ORDER BY
- Joining Tables Using JOIN



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**Description**

- Oracle Academy Software Bundle
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## Java Foundations – Course Description

### Overview

This course of study engages students with little programming experience. Students are introduced to object-oriented concepts, terminology, and syntax, and the steps required to create basic Java programs using hands-on, engaging activities. Students will learn the concepts of Java programming, design object-oriented applications with Java and create Java programs using hands-on, engaging activities.

### Available Curriculum Languages:

- Arabic, Simplified Chinese, English, French, Indonesian, Japanese, Brazilian Portuguese, Russian, Spanish

### Duration

- Recommended total course time: 90 hours\*
- Professional education credit hours for educators who complete Oracle Academy training: 30

*\* Course time includes instruction, self-study/homework, practices, projects and assessment*

### Target Audiences

#### Educators

- Technical, vocational, and 2- and 4-year college and university faculty members who teach computer programming, information communications technology (ICT), or a related subject at a foundational level
- Secondary and vocational school teachers who teach computer programming

#### Students

- Students who wish learn Java programming and build their Object Oriented Programming experience using Java
- This course is a suitable foundational class for computer science majors, and when taught in sequence with Java Programming may be used to prepare students for the AP Computer Science A exam

### Prerequisites

#### Required

- Oracle Academy Workshop - Getting Started with Java Using Alice
- Oracle Academy Workshop - Creating Java Programs with Greenfoot

#### Suggested

- Oracle Academy Course - Java Fundamentals

### Suggested Next Courses

- Oracle Academy Course - Java Programming

## Lesson-by-Lesson Topics

### Introduction

- About the Course
- Brief History
- Setting up Java

### Java Software Development

- The Software Development Process
- What is my Program Doing?
- Introduction to Object-Oriented Programming Concepts

### Java Data Types

- What is a Variable?
- Numeric Data
- Textual Data
- Converting Between Data Types
- Keyboard Input

### Java Methods and Library Classes

- What is a Method?
- The import Declaration and Packages
- The String Class
- The Random Class
- The Math Class

### Decision Statements

- Boolean Expressions and if/else Constructs
- Understanding Conditional Execution
- switch Statement

### Loop Constructs

- for Loops
- while and do-while Loops
- Using break and continue Statements

### Creating Classes

- Creating a Class?
- Instantiating Objects
- Constructors
- Overloading Methods
- Object Interaction and Encapsulation
- static Variables and Methods

### Arrays and Exceptions

- One-dimensional Arrays
- ArrayLists
- Exception Handling
- Debugging Concepts and Techniques

### JavaFX

- Introduction to Java FX
- Colors and Shapes
- Graphics, Audio and MouseEvents