

## COURSE OVERVIEW

**Course Title:** Level 7: Software Craftsmanship

**Course Number:**

**Number of Units:** 1.0 units

**Total Hours of Instruction:** 40

### Course Description

Learn to craft code like a pro! This course takes you from code monkey to software engineer with topics such as advanced refactoring, clean code, test-driven development, design patterns, techniques for working with legacy code, and how to be an Eclipse ninja. This course has been developed in collaboration with some of the best and most experienced programmers in San Diego. This is stuff they don't even teach you in college!

### Content and Evaluation

To be a professional programmer, just knowing programming is not enough. Professional software engineers need a lot more skills than just churning out code. They need to be careful to build the right thing, to make sure that it has longevity, integrates with other systems, and doesn't break or hinder other peoples work. To give our students a more rounded skill-set, we teach them techniques for safely fixing bugs, cleaning up existing ("legacy") code bases, designing software architecture, and writing automated test suites.

In this level, students hone their craft by studying software architecture and industry best practices. This course has been carefully developed in collaboration with local thought leaders.

The content is largely lecture-based with accompanying collaborative games & exercises, instructor-led programming examples, and technical assignments.

To complete this course, students take a 1.5 hour exam that consists of a written portion, and two coding exercises that require refactoring and unit testing, that must be completed independently.

### Extra Credit

n/a

### Methods of Instruction

- |                                     |                                    |                                     |                                |
|-------------------------------------|------------------------------------|-------------------------------------|--------------------------------|
| <input checked="" type="checkbox"/> | CLASS DISCUSSION/DISCUSSION BOARDS | <input checked="" type="checkbox"/> | LECTURES                       |
| <input type="checkbox"/>            | FIELD TRIPS                        | <input type="checkbox"/>            | CASE STUDIES                   |
| <input checked="" type="checkbox"/> | GROUP WORK                         | <input checked="" type="checkbox"/> | OTHER: PROGRAMMING ASSIGNMENTS |

### Out of Class Assignments

Total hours expected to complete assignments: n/a

- TEXTBOOK EXERCISES
- GROUP WORK
- STUDENT PROJECT

- X READINGS
- WRITTEN ASSIGNMENT/ESSAY(S)
- X OTHER: EXPLORATION OF CONCEPTS BY PROGRAMMING AT HOME

#### Evaluation/ Grading

- X EXAM(S)
- WRITTEN ASSIGNMENT/ESSAY(S)
- X OTHER: TWO CODE CLEANING EXERCISES

- CLASS PARTICIPATION/DISCUSSION BOARDS
- CLASS PROJECT(S)

#### Topical Outline

### **0. Introduction to Software Craftsmanship**

#### **1. Clean Code**

#### **2. Unit Testing**

#### **3. Advanced Refactoring**

#### **4. Programming Languages**

#### **5. Design Patterns**

#### **6. Concurrency**

#### **7. Agile**

#### **8. Retrospective**