



Pontificia Universidad Católica de Chile  
School of Engineering  
Department of Computer Science

## IIC2113 Detailed Software Design (II/2016)

### Course Program

<b>Professor</b>	: Rodrigo Arturo Saffie Kattan
<b>Email</b>	: <a href="mailto:rasaffie@ing.puc.cl">rasaffie@ing.puc.cl</a>
<b>Schedule</b>	: Tuesdays and Thursdays M3 (11:30 - 12:50)
<b>Assistantship schedule</b>	: Fridays M6 (17:00 - 18:20)
<b>Classroom</b>	: Javier Pinto (DCC)
<b>Prerequisites</b>	: IIC2143
<b>Assistants professors</b>	: - Nebil Kawas ( <a href="mailto:nakawas@uc.cl">nakawas@uc.cl</a> ) - Patricio López ( <a href="mailto:pelopez2@uc.cl">pelopez2@uc.cl</a> ) - Sebastián Salata ( <a href="mailto:sasalata@uc.cl">sasalata@uc.cl</a> )

## 1 Objectives

At the end of the course, each student will be able to:

- Design and program object oriented software with expertise
- Assess the quality of a software design, through practical and theoretical criteria
- Analyze software in order to improve its efficiency, confiability and maintainability
- Use software design patterns when designing software

## 2 Contents

The following list contains some of the topics which will be studied throughout the course:

1. Introduction
  - (a) What is detailed software design?
  - (b) 4+1 architectural view model
2. Detailed software design principles
  - (a) Cohesion
  - (b) Coupling
  - (c) Abstraction

- (d) Encapsulation
- (e) SOLID
- 3. Detailed software design applied to components
  - (a) Software design patterns
  - (b) *Frameworks*
- 4. Testing and refactoring
  - (a) Testing techniques
  - (b) *Code Smells*
  - (c) Refactoring techniques
  - (d) Code quality metrics
- 5. Reverse engineering

### 3 Communication channels

The course will count with two official communication channels. Announcements and grades will be published through the course's official web page available at the SIDING platform. Everything else will be distributed through [the course's Github organization](#).

### 4 Quizzes

The course considers periodical quizzes ( $C$ ) about its contents and readings.

### 5 Presentations

The students of this course will have to do two oral presentations ( $P$ ) about different subjects related with the course's contents. Such subjects will be announced with anticipation. Dates for presentations are:

<b>First Presentation</b>	October 13
<b>Second Presentation</b>	November 8

### 6 Assignments

The course considers three assignments ( $T$ ) throughout the semester. Their publication and due dates are:

	<b>Publication</b>	<b>Due</b>
<b>Assignment 1</b>	August 25	September 9
<b>Assignment 2</b>	September 22	October 7
<b>Assignment 3</b>	October 27	November 11

## 7 Tests

The course considers two tests ( $I$ ) throughout the semester. Their dates are:

<b>Test 1</b>	September 13
<b>Test 2</b>	October 18

## 8 Final Test

The course considers a final test ( $E$ ), which is mandatory. It will be on November 25, at 8:30 am.

## 9 Grading

The course's final grade ( $N'_f$ ) will be obtained with the following equation:

$$N'_f = 0.15 * \bar{C} + 0.15 * \bar{P} + 0.30 * \bar{T} + 0.20 * \bar{I} + 0.20 * E$$

In order to approve the course, the following conditions must be satisfied:

$$\bar{T} \geq 3.95$$

$$E \geq 2.95$$

$$N'_f \geq 3.95$$

Considering the above statements, the final grade will be:

$$N_f = \begin{cases} N'_f & \text{if all conditions are met} \\ \min\{3.9, N'_f\} & \text{if one or more conditions are not met} \end{cases}$$

## 10 Bibliography

- FOWLER, M., ET AL., *Patterns of Enterprise Application Architecture*, ADDISON-WESLEY, 2003.
- FOWLER, M., ET AL., *Refactoring: Improving the Design of Existing Code*, ADDISON-WESLEY, 2000.
- FOWLER, M., ET AL., *UML Distilled, (3<sup>d</sup> ed.)*, ADDISON-WESLEY, 2004.
- GAMMA, E., ET AL., *Design Patterns: Elements of Reusable Object-Oriented Software, (1<sup>st</sup> ed.)*, ADDISON-WESLEY, 1994.
- MARTIN, R. C. *Clean Code: A Handbook of Agile Software Craftsmanship, (1<sup>st</sup> ed.)*, PRENTICE HALL, 2008.
- PRESSMAN, R. S. *Software Engineering: A Practitioner's Approach, (7<sup>th</sup> ed.)*, MCGRAW-HILL EDUCATION, 2009.

## 11 Academic Integrity Policy

The course adheres to the University's official academic integrity policy, which can be found in the following [link](#).