

PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE  
COLLEGE OF ENGINEERING  
DEPARTMENT OF COMPUTER SCIENCE  
ABET COURSE SYLLABI

**IIC2143 SOFTWARE ENGINEERING**

**Credits and contact hours:** 10 credits / 10 hours (3h Lecture; 1.5 Assistantship; 5.5 Individual learning experience (project))

**Instructor's name:** Rosa Alarcon

**Course coordinator's name** Rosa Alarcon

**Textbook:** Applying UML and patterns: An introduction to object-oriented analysis and desing and the unified process, Larman, C., (2002). Prentice hall PTR upper Saddle River, NJ, USA.

**Course Catalog Description:** This course focuses on the techniques to design and develop software, from the discovery and specification of requirements to the design, development, and testing, placing an emphasis on software design and construction.

**Prerequisite Courses:** IIC2233 Advanced Computer Programing

**Co-requisite Courses:** None

**Status in the Curriculum:** Required

**Course Learning Outcomes:**

1. Understand and apply a methodical software development approach, starting with the formulation of system requirements, developing a modular design, refining this design on an implementation to identify and minimize risk, encoding so that it can be integrated with the work of a team, and using methods to identify and prevent failures.
2. Develop clear, concise and accurate requirements for the development of a new software product (system), based on the needs of users and other stakeholders' requirements.
3. Apply principles such as abstraction, decomposition, information hiding coupling and cohesion, and software patterns in order to design and evaluate a system.
4. Create UML class diagrams to model the problem domain and the software architecture of a system.
5. Create sequence, state, and activity UML diagrams in order to model use cases and, more generally, the behavior of a system.
6. Apply simple testing techniques at different levels of a software product; e.g. writing basic black box tests for classes and methods.

**Relation of Course to ABET  
Criteria:**

- a. Knowledge of mathematics, science and engineering.
- b. Design a system, component, or process.
- c. Multidisciplinary teams.
- d. Identify, formulate, and solve engineering problems.
- e. Professional and ethical responsibility.
- f. Effective communication.
- g. Broad education necessary for global, economic, environmental and societal context.
- h. Recognition of the need for, and an ability to engage in life-long learning.
- i. Knowledge of contemporary issues.
- j. Techniques, skills, and modern tools for engineering practice.

**Topics covered:**

1. Software fundamentals, tools and requirements.
2. Software design, UML, Software patterns, Software Architecture.
3. Software Construction, code practices and standards, refactoring and integration techniques.
4. Testing and development techniques, validation and verification, test unit, code testing tools.
5. Code evolution and debugging.
6. Human-Computer Interaction.