PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE
COLLEGE OF ENGINERING
DEPARTAMENT OF COMPUTER SCIENCE
ABET COURSE SYLLABI

IIC3745 TESTING

Credits and contact hours:	10 credits / 10 hours (3 h. Lectures; 1,5 h. Labs; 5,5 individual work hours per week)
Instructor's name:	To be defined
Course coordinator's name	Rosa Alarcón
Textbook:	Ammann, P.; Offutt, J. (2008) Introduction to Software Testing. Cambridge University Press, Galin, D. (2004). Software quality assurance. Addison Wesley. Agarwal, B., Tayal, S., Gupta, M. (2010) Software Engineering & Testing: An Introduction. Jones and Bartlett Publishers. Whittaker, J. (2009) Exploratory Software Testing. Addison Wesley.
Course Catalog Description:	This course focuses on the techniques for ensuring software quality. Software testing is seen as an integral activity taking place throughout all development process: to understand client and user needs, to analyze and document requirements, and finally to verify and validate the solutions through testing.
Prerequisite Courses:	IIC2143 Software engineering
Co-requisite Courses:	None
Status in the Curriculum:	Required
Course Learning Outcomes:	1. Analyze requirements for determining appropriate testing strategies. 2. Design and implement test plans. 3. Apply techniques of effective and efficient tests. 4. Calculate test coverage, and interpret its result according to a variety of criteria. 5. Use statistical techniques to evaluate the defect density and probability of failure. 6. Conduct reviews and inspections.

Relation of Course to ABET Criteria:

b. Design and conduct experiments: analyze and interpret data
e. Identify, formulate, and solve engineering problems
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. Fundamentals of testing.
   1.1. Why is testing necessary?
   1.2. What is testing?
   1.3. Seven testing principles.
   1.4. Fundamental test process.
   1.5. The psychology of testing.
2. Testing throughout the software life cycle
   2.1. Software development models
   2.2. Test levels
   2.3. Test types
   2.4. Maintenance testing
3. Test documentation: IEEE 829-2008.
4. Static techniques
   4.1. Static techniques and the test process.
   4.2. Review process
   4.3. Static analysis by tools.
5. Test Design techniques
   5.1. The test development process
   5.2. Categories of test design techniques
   5.3. Specification-based or Black-box techniques
   5.4. Structure-based or White-box techniques
   5.5. Experience-based techniques
   5.6. Choosing test techniques.
6. Test Management
   6.1. Test organization
   6.2. Test planning and estimation
   6.3. Test progress monitoring and control
   6.4. Configuration management
   6.5. Risk and testing
   6.6. Incident management.
7. Tool support for testing
   7.1. Types of test tools
   7.2. Effective use of tools: potential benefits and risks.