SUBJECT PROGRAM

I. IDENTIFICATION OF THE SUBJECT

Subject: **Distributed Systems**		Acronym: **INF-343**	Approval date 10/11/2016 (CC.DD. Agreement 13/2016)		
UTFSM Credits: **3**	Prerequisites: **INF-256**	Final exam: **none**	Faculty		
SCT Credits: **5**			**Computer Science Department**		
Weekly Lecture Hours: 3	Weekly Assistantship Hours: **1.5**	Weekly Laboratory Hours: **0**	Semester		
			Odd	Pair **X**	Both
Formative axis: **Applied Engineering - Development and Management of ICT Infrastructure**					
Total time dedicated to the subject: **151 chronological hours**					

Description of the Subject

The student applies the fundamentals of distributed computing systems, through the study of theoretical models, techniques and methods to solve problems in scenarios where data, processing or control may be physically or logically distributed. The student uses aspects associated with performance, reliability and security for the design and construction of distributed systems. Students gain a solid understanding of modern computer systems, which are built based on interconnected systems of components which interact through communications networks.

Entry requirements

• Understands the architecture, components and mechanisms used in operating systems.   • Network architecture and communications services, with their main components and standard communication protocols.   • Object-oriented programming and solving of concurrent programming problems.

Contribution to the graduation profile

Specific Competence   • Understand and analyze the operation of computers at hardware level, operating systems, digital communications, and distributed systems.   **Transversal Competencies**   • Act with autonomy, flexibility, initiative, and critical thinking when facing professional problems.   • Develop of working processes with solid criteria which allow to ensure quality from a systemic perspective.

Learning outcomes expected to be achieved in this subject

• **Analyses of** fundamental concepts for distributed computing and programming paradigms, **solving** distributed programming problems.   • **Distinguishment of** different architectural styles and design techniques for distributed systems & **Application** in the design for corresponding system types.   • **Analyses of** design problems of distributed systems & **Application** of one or a combination of basic distributed algorithms in solving these problems.   • **Application** of design techniques to solve problems specific to the area of distributed systems by **Consideration of** aspects such as performance, reliability and security.

Thematic contents

• General concepts and architectures in Distributed Systems.   • Distributed Software Development.   • Distributed Computing Theory.   • Distributed Algorithms.   • Fault Tolerance.   • Database and Distributed Transactions.   • Data and Process Replication.   • Security in Distributed Systems.

Teaching and learning methodology

• Expository classes. • PBL (Problem Based Learning). • Some elements of active class methodologies. • Cooperative/collaborative learning.

Evaluation and grading of the subject (Adjusted to Institutional Regulations-Regulation No. 1)

Approval and qualification requirements	It is evaluated using the following instruments:
	Instruments	**Percentage**
	2 Exams (33.5% each)	67%
	3 Tasks	33%

Resources for learning.

- Virtual platform

Bibliography:

Guide Text	• Coulouris, et.al. (2011). "Distributed Systems: Concepts and Design" 5 th. Edition, Addison Wesley.
Complementary or Optional	• Tanenbaum, M. van Steen. (2006) "Distributed Systems: Principles and Paradigms", 2nd. Edition, Prentice Hall. • M. Singhla & NG Shivaratri. (1994) "Advanced Concepts in Operating Systems", McGraw-Hill. • Wan Fokkink (2013) "Distributed Algorithms: An Intuitive Approach", The MIT Press. • Pankaj Jalote (1994) "Fault Tolerance in Distributed Systems", Prentice Hall.

II. CALCULATION OF NUMBER OF HOURS OF DEDICATION - (SCT-Chile) - SUMMARY TABLE OF THE SUBJECT

ACTIVITY	Number of hours of dedication		
	Number of hours per week	Number of weeks	Total number of hours
PRESENCE			
Lecture or theoretical classes	3	15	45
Assistantship/Exercises	1,5	8	12
Industrial visits (from Field)			
Laboratories / Workshop			
Evaluations (Exams, others)	2	2	4
Others (specify)			
NO PRESENCE			
Assistantship			
Mandatory tasks (group)	10	3	30
Personal Study (Individual or group)	4	15	60
Others (specify)			
TOTAL (HOURS)			151
Total number of TRANSFERABLE CREDITS			5