SUBJECT PROGRAM

I.   IDENTIFICATION OF THE SUBJECT

Subject: **Operations Research**		Acronym: **INF-293**	Approval date 10/11/2016 (CC.DD. Agreement 13/2016)		
UTFSM Credits: **3**	Prerequisites: **INF-292**	Exam: **Does not have**	Faculty.		
SCT Credits: **5**			**Computer Science Department**		
Lecture Hours Weekly: **3**	Assistantship: **Yes**	Laboratory: **Does not have**	Semester in which it is taught		
			Odd **x**	Pair	Both
Formative axis: **Engineering Sciences - Computing for complex problems in industry**					
Total time dedicated to the subject: **150 chronological hours.**					

Subject Description

The student acquires the necessary knowledge to be able to make decisions based on programming and quantitative methodology. Applies decision-making techniques, programming and using specialized software. Develops systemic thinking and modeling skills for professional problem solving.

Entry requirements

• Design algorithms of medium computational complexity. • Use data structures. • Use probability distributions.

Contribution to the graduation profile

Specific Competence • Make decisions under certainty, risk and uncertainty, basing them with the application of quantitative techniques. **Transversal Competencies** • Communicate oral and written information effectively both within the organizations in which one works and with entities in the environment. • Interact, in the middle, establishing communication networks in Spanish and English. • Integrate, coordinate and direct work teams, applying knowledge of resource management: human, technical, economic and time. • Act with autonomy, flexibility, initiative, and critical thinking when facing professional problems. • Develop their work with solid criteria that allow you to ensure quality from a systemic perspective

Learning outcomes expected to be achieved in this subject

- **Analyzes** specific cases, **identifying** common decision problems.
- **Identify** real-world problems, **formulating** decision models.
- **Solve** real-world decisional problems **using** fundamental operations research concepts.

- **It integrates** algorithmic tools from operations research, **using them** to solve problems.

- **Use** algorithmic tools, **evaluating** their *performance.*

Thematic contents

- Concepts related to decision theory.
- Decisional models with multiple objectives.
- Concepts related to queuing theory and their identification in real-world problems.
- Concepts related to inventory theory and the identification of real problems.
- Models for the design of intelligent systems.
- Trends in current research.

Teaching and learning methodology

- Expository classes supported by visual media.
- Problem Based Learning (PBL).
- Project-oriented learning with presentation and defense.
- Study of cases.

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

Approval and qualification requirements.	**Evaluation and qualification process:** It is evaluated through • 2 exams • 1 project (I part: 20%, II Part and Defense: 80%). If the average number of exams => 50 then: **Final grade = Average exams*0.6+ project*0.4** Otherwise: **Final grade = Average tests** In case of justifiably missing a competition, a global exam must be taken, which will correspond to the grade of the missing competition.

Resources for learning. Bibliography:

Guide Text	• An Introduction to Management Science: Quantitative Approaches to Decision Making. Anderson, Sweeney & Williams, 14h [ed.], South Western Ed. 2016.
Complementary or Optional	• Adaptive Business Intelligence, Zbigniew Michalewicz, Martin Schmidt, Matthew Michalewicz, Constantin Chiriac, Springer, 2006 • Decision Support and Business Intelligence Systems, Turban, Aroson, Lian Ting-Peng and Shartda, Prentice Hall 10th ed. 2014. • Applied Management Science: Modeling, Spreadsheet Analysis, and Communication for Decision Making, Laurence and Pasternack, Wiley, 2004.

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

ACTIVITY	Number of hours of dedication		
	Number of hours per week	**Number of weeks**	**Total number of hours**
PRESENCE			
Lecture or theoretical classes	3	14	42
Assistantship/Exercises	1.5	14	twenty-one
Industrial visits (from Field)			
Laboratories / Workshop			
Evaluations (exams, presentations)	2	3	6
Others			
NO PRESENCE			
Online assistantship	2	5	10
Mandatory tasks			
Personal Study (Individual or group)	3	17	51
Others (Project)	2	10	twenty
TOTAL (HOURS)			**150**
Total number of TRANSFERABLE CREDITS			**5**