SUBJECT PROGRAM

I. IDENTIFICATION OF THE SUBJECT

<table>
<tr><td colspan="2">Subject: Optimization</td><td>Acronym: INF-2292</td><td colspan="4">Approval date
10/11/2016
(CC.DD. Agreement 13/2016)</td></tr>
<tr><td>UTFSM Credits : 3</td><td rowspan="2">Prerequisites:
MAT-023</td><td rowspan="2">Exam: Does not have</td><td colspan="4">Faculty</td></tr>
<tr><td>SCT Credits : 5</td><td colspan="4">Computer Science Department</td></tr>
<tr><td rowspan="2">Weekly Lecture Hours : 3</td><td rowspan="2">Weekly Assistantship Hours: 1.5</td><td rowspan="2">Weekly Laboratory Hours: 0</td><td colspan="4">Semester in which it is taught</td></tr>
<tr><td>Odd</td><td>Pair
X</td><td colspan="2">Both</td></tr>
<tr><td colspan="6">Formative axis: Engineering Sciences - Computer Science for Complex problems in Industry</td></tr>
<tr><td colspan="6">Total time dedicated to the subject: 150 chronological hours</td></tr>
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Subject description

Students understand the fundamentals of formulating deterministic mathematical programming models. Solve developed models and analyze the results, using optimization algorithms. They apply linear, integer linear or dynamic programming models to solve real problems.
Students develop solid knowledge to solve mathematical programming problems, integrating network modeling.

Entry Requirements

- Apply linear algebra concepts.
- Program in C.

Contribution to the graduation profile

Specific Competence

- Make decisions under certainty, risk, and uncertainty, basing them with the application of quantitative techniques.

Transversal Competencies

- 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

- **Classifies** linear programming problems, **identifying** the type of solution.
- **Apply** linear or integer linear programming models, **solving** real problems
- **Analyzes** the types of linear, integer linear and dynamic programming, **solving** real problems.
- **Formulate** a linear programming model, **solving** real problems.
- Mathematical programming problems, **using** network modeling.

Thematic contents

- Linear programming.
- Integer Linear Programming.
- Dynamic Programming.
- Network Theory.
- Project Scheduling Techniques.

- Expository classes supported by visual media.
- Learning based on problem solving and cases.
- Project-oriented learning.
- Collaborative or cooperative work.

Teaching and learning methodology

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

Approval requirements and qualification	It is evaluated through 3 tests (C1, C2 and C3), tasks and a project. **Evaluation instrument** / **%** Competition (C1) / 20 Competition (C2) / 20 Competition (C3) / 20 Average Tasks (PT) / 10 Project Average / 30 If the average of tests is less than 55, the student fails with a final grade = (C1 + C2 + C3)/3. If the average number of exams is equal to or greater than 55, the previous table applies.

Learning Resources

Virtual platform

Bibliography:

Guide text	• Frederick S. Hillier and Gerald J. Lieberman (2009). Introduction to Operations Research, 9th edition, Mc Graw Hill.
Complementary or optional	• David R. Anderson, Dennis J. Sweeney, Thomas A. Williams, Jeffrey D. Camm & R. Kipp Martin (2011). An Introduction to Management Science: Quantitative Approaches to Decision Making, Revised, 13th edition, South-Western. • Wayne L. Winston (2003). Operations Research: Applications and Algorithms, 4th edition, Cengage Learning. • Hamdy A. Taha (2010). Operations Research: An Introduction, 9th edition, Pearson.

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	16	48
Assistantship/Exercises	1.5	16	24
Industrial visits (from Field)			
Laboratories / Workshop			
Evaluations (exams, others)	2	3	6
Others (specify)			
NO PRESENCE			
Assistantship			
Mandatory tasks	3	10	30
Personal Study (Individual or group)	3	6	18
Others (Project)	2	12	24
TOTAL (HOURS)			**150**
Total number of TRANSFERABLE CREDITS			**5**