SUBJECT PROGRAM

I. IDENTIFICATION OF THE SUBJECT.

Subject: **Discrete Structures.**		Acronym: **INF-152.**	Approval date		
UTFSM Credits : **3**	Prerequisites: **MAT-021 and IWI-131.**	Exam: **None.**	Faculty.		
SCT Credits : **5**			**Computer Science Department**		
Lecture Hours **Weekly : 3**	Hours Assistantship Weekly : **1.5**	Weekly Laboratory Hours: **0**	Semester in which it is taught		
			Odd **X**	Pair	Both
Formative axis : **Engineering Sciences - Fundamentals of Computer Science.**					
Total time dedicated to Subject : **163 chronological hours.**					

Subject Description

This subject is part of the curriculum of the Ingeniería Civil Informática degree in the line of fundamentals of computer science, leading to the degree Licenciatura en Ciencias de la Ingeniería. The purpose of this is to introduce the fundamentals of discrete structures in their application to computer science and provide the theoretical foundations for subsequent subjects.

Entry requirements

- Solve basic problems by programming their solutions in a programming language.
- Perform main operations of logic, sets, relationships, and functions.

Contribution to the graduation profile

The activities carried out in this subject contribute on developing the following specific and transversal skills:

General profile skills:

- Conceive, model, design, evaluate and implement alternative computer technology solutions, based on the analysis of specific problems in any business area.
- Integrate, direct and coordinate project teams that implement computer technology solutions, managing human, technical, economic and time resources to ensure compliance with objectives.

Specific Competence:

- Apply theoretical and algorithmic foundations to develop efficient ways to solve computational problems.

Elements of Competencies:

- Build computational models to solve problems, selecting and designing appropriate algorithms and data structures.
- Model and design solution algorithms for computer science problems applying the fundamentals of discrete mathematics.
- Apply algorithm design strategies to solve problems in computing.

Transversal Competencies:

- Communicate oral and written information effectively within the organizations in which one works, as well as with entities in the environment.
- Act with autonomy, flexibility, initiative, and critical thinking when facing professional problems.

Learning Results that are expected to be achieved in this subject.

- Analyze algorithms and computational systems, applying discrete mathematical reasoning.
- Design algorithms, applying discrete data structures and proof techniques.
- Calculates the number of results of combinatorial processes, applying counting principles.
- Model computer science problems, using graphs and trees.

Thematic contents

- Sets, functions, and relations.
- Logic of propositions and predicates.
- Demonstration techniques.
- Basic counting.
- Trees.
- Undirected graphs.
- Directed graphs.
- Traversal strategies for trees and graphs.

Teaching and learning methodology.

- Expository method / Traditional class.
- Resolution of exercises.
- Problem-based learning.
- Cooperative/collaborative learning.

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

Approval requirements and qualification

EVALUATION PROCESS

The evaluations carried out in this subject are the following: exams, controls and class work.

Evaluation type	No.	Value in %
Competition (C1)	1	30
Competition (C2)	2	35
Controls (C)	8	30
Class work (T)	7	5

Final grade for the subject is calculated as follows:

- **NC:** Average of the controls.
- **T:** Average class work.

Final grade = 0.3*C1 + 0.35*C2 + 0.3*NC + 0.05*T

Learning resources Bibliography:

Guide Text	• Rosen KH “Discrete Mathematics and its Applications”. Mc Graw Hill, 5th edition, 2004. • von Brand, H. Notes. "Computer basics". Material published on Virtual Platform.
Complementary or Optional	• Virtual platform.

II. 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)	1.5	2	3
Others (specify)			
NO PRESENCE			
Assistantship			
Mandatory tasks			
Personal Study (Individual or group)	5	17	85
Others (specify)			
TOTAL (HOURS)			**163**
Total number of TRANSFERABLE CREDITS			**5**