

SUBJECT PROGRAM

YO. SUBJECT IDENTIFICATION

Subject: Artificial Intelligence		Acronym: INF-295	Approval date 08/11/2015 (Agreement 13/2015)		
UTFSM Credits: 3	Prerequisites: INF-134 + INF-292 or ILI-134 + ILI-292	Exam: Does not have	Faculty.		
SCT Credits: 5			Computer Science Department		
Lecture Hours Weekly: 3	Weekly Assistantship Hours: 0.7	Weekly Laboratory Hours: 0	Semester in which it is taught		
			Odd	Pair X	Both
Formative axis: Fundamentals: Engineering Sciences and Models and Methods					
Total time dedicated to the subject: 144 chronological hours					

Subject Description

Students develop artificial intelligence techniques that allow them to solve highly complex problems that cannot be solved by traditional mathematical models; using programming to design efficient algorithms. Additionally, students develop systems thinking and modeling skills for professional problem-solving.

Entry requirements

- Design algorithms of medium computational complexity.
- Use data structures.

Contribution to the graduation profile

- Conceive, model, design, evaluate and implement alternative computer technology solutions, based on the analysis of specific problems in any business area.
- Generate entrepreneurship and innovations, identifying opportunities to improve processes with computer technologies and products.
- Act with autonomy, flexibility and initiative in their work.
- Incorporate a dynamic of permanent updating of their skills, typical of a rigorous, effective, and efficient task, based on their determination and tenacity.

Specific Competition.

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

Elements of Competition.

- Select and apply Operations Research techniques to solve a problem by evaluating the results obtained.
- Learn to face and propose solutions using algorithmic strategies in complex problems.

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

- **Solve** complex real-world problems, **using** fundamental concepts of artificial intelligence.
- **Identifies** classic combinatorial problems with satisfaction of constraints (CSOP and CSP), **analyzing** specific case studies.
- **Identify** real-world problems, **formulating** combinatorial models.
- **It integrates** algorithmic tools from artificial intelligence, **using them** to solve problems.
- **Use** algorithmic tools, **evaluating** their performance.

Thematic contents

- Concepts related to intelligent agents.
- Combinatorial models: history, and their relationship with real-world problems.
- Algorithms for solving constraint satisfaction problems (CSP). Filter techniques: consistency arc, consistency trajectory, multiple consistency arc (MAC).
- Resolution: backtracking.
- Hybrid techniques: with memorization, with learning, using constraint decomposition.
- Incomplete algorithms. Local search: hill climbing, greedy search. Metaheuristic techniques: tabu search, simulated annealing, genetic algorithms, social intelligence.
- Trends in current research.

Teaching and learning methodology

- Expository classes supported by visual media.
- Learning based on problem solving.
- Project-oriented learning with defense.
- Study of cases.

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

Approval and qualification requirements.	<p>Evaluation and qualification process:</p> <p>It is evaluated through 2 exams and 1 project (Part I: 20%, Part II and Defense: 80%).</p> <p>If the average number of exams => 50 then:</p> <p style="text-align: center;">Final grade = Average exams*0.6+ project*0.4</p> <p>Otherwise:</p> <p style="text-align: center;">Final grade = competition average</p> <p>In case of justifiably missing a competition, a global exam must be taken, which will correspond to the grade of the missing competition.</p>
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Resources for learning.

Bibliography:

Guide Text	<ul style="list-style-type: none"> • Russel, S., Norvig, P. (2013). Artificial Intelligence: A Modern Approach, Pearson Publishing.
Complementary or Optional	<ul style="list-style-type: none"> • Michalewicz, Z. Fogel, D. (2004). How to solve it: Modern Heuristics, Springer Publishing. • Rossi, F., van Beek, P. (2006). Walsh Handbook of Constraint Programming (Foundations of Artificial Intelligence). Elsevier Publishing. • Xin-She Yang. (2014). Artificial Intelligence, Evolutionary Computing and Metaheuristics: In the Footsteps of Alan Turing. Springer Publishing. • 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	14	42
Assistantship/Exercises	3	4	12
Industrial visits (from Field)			
Laboratories / Workshop			
Evaluations (exams, others)	3	3	9
Others (specify)			
NO PRESENCE			
Online assistantship	2	5	10
Mandatory tasks			
Personal Study (Individual or group)	3	17	51
Others (Project)	2	10	twenty
TOTAL (HOURS)			144
Total number of TRANSFERABLE CREDITS			5