

SUBJECT PROGRAM

I. IDENTIFICATION OF THE SUBJECT.

Subject: Programming languages.		Acronym: INF253.	Approval date 10/21/2014 (CC.DD. Agreement 12/2014)			
UTFSM Credits : 3	Prerequisites: INF-134 or ILI-134.	Exam: None.	Faculty.			
SCT Credits : 5			Computer Science Department			
Weekly Lecture Hours : 3	Weekly Assistantship Hours: 1.5	Weekly Laboratory Hours:	Semester in which it is taught			
			Odd	Even X	Both	
Formative axis : Advanced Programming-Engineering Sciences.						
Total time dedicated to the subject : 158 chronological hours.						

Subject Description

This subject is part of the curriculum of the Ingeniería Civil Informática degree, leading to the Licenciatura en Ciencias de la Ingeniería. The purpose of this is to teach the most relevant concepts associated with language design and the main programming paradigms, which allow the student to critically evaluate different programming languages and choose the most appropriate one, to solve a certain type of programming problem and facilitate learning new languages.

Entry requirements

- Program in a programming language.
- Use basic data types and data structures.
- Know the basic concepts of propositional and predicate logic.
- Master concepts of mathematical functions.

Contribution to the graduation profile

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

- Conceive, model, design, evaluate and implement alternative computer technology solutions, based on the analysis of specific problems in any business area.
- 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.
- Manifest behaviors and attitudes of responsibility and social solidarity, respecting ethical and regulatory principles typical of the Engineering professional as the foundations of their work, as well as of Computer Science in particular.

Specific Competence:

- Analyze problems that can be solved computationally, design algorithms and program the solutions using the appropriate tools in terms of programming language and data structures.

Elements of Competencies:

- Analyze algorithms and develop programs based on different programming paradigms.
- Analyze problems, design algorithms and program with different data structures to solve a given problem.

Transversal Competencies:

- Communicate oral and written information effectively within the organizations in which one works, as well as with entities in the environment.
- Integrate, coordinate and direct work teams, applying knowledge of human, technical, economic and time management.
- Act with autonomy, flexibility, initiative, and critical thinking when facing professional problems.
- Incorporate a dynamic of permanent updating of their skills, strengthening their innovative and entrepreneurial spirit.
- Develop their work with solid criteria that allow you to ensure quality from a systemic perspective.
- Manifest behaviors and attitudes of social responsibility and tolerance, valuing ethical principles.

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

- Classify programming languages, identifying their main programming paradigms.
- Critically evaluate the main programming languages, considering their design elements.
- Select the most appropriate programming language, analyzing the type of problem to be solved.
- Incorporate new programming languages into their professional training, applying learning autonomy skills.
- Develop the solution to at least one problem that represents each of the programming paradigms, programming in the corresponding language.

Thematic contents

- General introduction to the development of programming languages.
- Elements of formal languages in the design of programming languages.
- Data types in different programming languages.
- Expressions and control structures.
- Abstract data types and object-oriented programming.
- Functional programming.
- Logical and declarative programming.
- Scripting languages.

Teaching and learning methodology.

- Expository classes and discussion of the subject.
- Problem solving in personal study.
- Resolution of programming problems in different paradigms in teamwork.

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

Approval requirements and qualification	<p><u>EVALUATION PROCESS:</u></p> <p>This subject is evaluated individually and in groups.</p> <p><u>Individual evaluation (66%):</u></p> <ul style="list-style-type: none"> • Exams: 2 Exams (23% each). • Controls: 5 controls (4% each). <p><u>Group evaluation (34%):</u></p> <ul style="list-style-type: none"> • EG: 5 Group tasks. <p style="text-align: center;">NF= Cert*0.46 + controls*0.2+EG*0.34</p>
---	--

Resources for learning.

Bibliography:

Guide Text	<ul style="list-style-type: none"> • Sebesta, RW, “<i>Concepts of Programming Languages</i>”, 10th edition, Addison Wesley, 2011.
Complementary or Optional	<ul style="list-style-type: none"> • Louden, KC, Kenneth A. Lambert, “<i>Programming Languages: Principles and Practices</i>”, Course Technology, 3rd edition, 2011. • Bloch, J, “<i>Effective Java</i>”, 2nd edition. Addison - Wesley, 2008. • Kent Dybvig, R. “<i>The Scheme Programming Language</i>”, 4th edition, The MIT Press, 2009. • Clocksin, W. F. Christopher S. Mellish. “<i>Programming in Prolog: Using the ISO Standard</i>”, 5th edition, Springer Verlag, 2003. • Beazley, D.M. “<i>Python Essential Reference</i>”, 4th edition, Addison-Wesley Professional, 2009.

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

ACTIVITY	Number of hours of dedication		
	Number of hours per	Total amount of	week weeks hours
PRESENCE			
Lecture or theoretical classes	3	17	51
Assistantship/Exercises	1.5	12	18
Industrial visits (from Field)			
Laboratories / Workshop			
Evaluations (exams, others)			
Others (Web search + library)	2	fifteen	30
NO PRESENCE			
Assistantship			
Mandatory tasks	5	5	25
Personal Study (Individual or group)	2	17	3. 4
Project			
TOTAL (HOURS)			158
Total number of TRANSFERABLE CREDITS			5