

## SUBJECT TEACHING GUIDE

G1662 - Programming Languages

Degree in Computer Systems Engineering

Academic year 2020-2021

1. IDENTIFYING DATA					
Degree	Degree in Computer Systems Engineering			Type and Year	Optional. Year 4
Faculty	Faculty of Sciences				
Discipline	Subject Area: Computing Mention in Computing				
Course unit title and code	G1662 - Programming Languages				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web	<a href="http://personales.unican.es/gomezd">http://personales.unican.es/gomezd</a>				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. MATEMATICAS, ESTADISTICA Y COMPUTACION				
Name of lecturer	DOMINGO GOMEZ PEREZ				
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Office	Facultad de Ciencias. Planta: + 1. DESPACHO (1051)				
Other lecturers					

3.1 LEARNING OUTCOMES
- Practical knowledge of development of compilers for domain specific languages.
- Hands-on experience on back ends and front-ends. The use of Scoping and declarative programming in modern compilers.
- Knowledge of applicability of compilers, as in web browsers.

#### 4. OBJECTIVES

Apply the skills acquired in formal languages for compiler development.

Understand the intrinsic complexity to generate machine code

Understand the use of pushdown automata and their role in a compiler.

Generate concise error messages for source code.

Learn the abilities necessary to use of parser generator tools.

#### 6. COURSE ORGANIZATION

##### CONTENTS

1	Part 1: Theoretical background
1.1	Background and overview of formal languages
1.2	Bottom up parsing
1.3	Types of bottom up parsing
1.4	Attribute grammars
1.5	Type checking and code generation
1.6	Bootstrapping
2	Part 2: Tools
2.1	Python
2.2	Lexer generation
2.3	Parser generators
2.4	Intermediate code
2.5	Native code

## 7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Final Exam	Written exam	Yes	Yes	50,00
Individual assignment	Work	No	Yes	20,00
Group assignment	Work	No	Yes	20,00
Classroom assignment	Activity evaluation with Virtual Media	No	Yes	10,00
<b>TOTAL</b>				<b>100,00</b>
<b>Observations</b>				
<p>Students can substitute continuous evaluation by a practical exam if:</p> <ul style="list-style-type: none"> <li>- they are registered as a part-time student,</li> <li>- they fail any of the task in the continuous evaluation or want to improve their grades.</li> </ul> <p>The value equals to 50% of the final grade and it lasts for approximately 2 hours. It will be required that the student presents all pending assignments to apply to this condition.</p> <p>In the case that socio-sanitary conditions advise the end of in-person teaching, the final exam will be replaced by a practical exam and a written exam. The availability of resources will determine how the exams are performed, attempting to implement a asynchronous and telematic method.</p> <p>In the case that socio-sanitary conditions advise the end of in-person teaching, the final exam will be replaced by a practical exam and a written exam. The availability of resources will determine how the exams are performed, attempting to implement a asynchronous and telematic method.</p>				
<b>Observations for part-time students</b>				
<p>Any student who is registered as partial-time student is allowed to choose between continuous evaluation or two final exams. The percentage of the exams in the final grade will be 90% and 10%, respectively.</p>				

## 8. BIBLIOGRAPHY AND TEACHING MATERIALS

### BASIC

Torben Mogensen. Basics of compiler design

Andrew W. Appel Modern. Compiler Implementation in Java

Alfred Aho, Monica Lam, Ravi Sethi, and Jeffrey Ullman.

Compilers: Principles, Techniques, and Tools (Second Edition)