[MGA102] ANALYSIS OF POWER ELECTRONIC CONVERTERS

GENERAL INFORMATION

Studies	UNIVERSTIY MASTER IN ENERGY AND POWER ELECTRONICS			**Subject**	POWER CONVERTER DESIGN, MODELLING AND ANALYSIS
Semester	1	**Course**	1	**Mention / Field of specialisation**	
Character	COMPULSORY				
Plan	2015	**Modality**	Adapted Face-to-face	**Language**	ENGLISH
Credits	6	**Hours/week**	3.94	**Total hours**	71 class hours + 79 non-class hours = **150 total hours**

PROFESSORS

BARRENA BRUÑA, ION ANDONI
AGIRRE VIANA, XABIER

REQUIRED PREVIOUS KNOWLEDGE

Subjects	Knowledge
(No specific previous subjects required)	*(No previous knowledge required)*

SKILLS

VERIFICA SKILLS

SPECIFIC

MGC02 - Analysing the thermal behaviour of the converter.

MGC04 - Evaluating the degree of compliance with the different regulations that apply to a converter.

MGC05 - Designing and innovating in the modulation techniques of a converter, in order to optimise its operation and performance.

CROSS

MGTR10 - To share knowledge, reasoning and conclusions with specialist and non-specialist audiences in clear, unambiguous ways.

MGTR11 - To lead work teams effectively and efficiently in order to achieve common goals.

MGTR12 - To analyse complex information and situations in the field of study, considering several solutions for each problem and making the right decision in a given context, taking social and ethical implications into account.

MGTR13 - To identify product or business development opportunities, managing the human and material resources adequately.

BASIC

M_CB9 - To share knowledge, conclusions and their rationale with specialised and lay audiences in a clear, unambiguous manner

CONTENTS

1. Introduction- High-Power Converter applications- Basic concepts2. Two-level VSC modulation strategies- Square wave modulation- PWM- Space Vector Modulation (SVM, SV-PWM)- Selective Harmonic Elimination Modulation (SHEM)3. Basic VSC Multilevel Converters- NPC- Flying Caps- H-Bridge Cascaded multilevel4. Advanced VSC topologies- Hybrid multilevel converters- Modular Multilevel Converter (MMC)- Multipulse Converters using magnetic elements5. Current Source Converter topologies

LEARNING RESOURCES AND BIBLIOGRAPHY

Learning resources	Bibliography
Subject notes	High-Power Converters and AC Drives, Bin Wu; ISBN: 978-0-471-73171-9, Wiley-IEEE Press
Slides of the subject	
Computer practical training	
Specific Master Software	