SUBJECT TEACHING GUIDE

G612 - Further Nuclear Engineering and Nuclear Fuel Cycle

Degree in Energy Resources Engineering

Academic year 2016-2017

1. IDENTIFYING DATA					
Degree	Degree in Energy Resources Engineering			Type and Year	Optional. Year 4
Faculty					
Discipline	Optional Subjects for Energy Resources Module: Optional Training				
Course unit title and code	G612 - Further Nuclear Engineering and Nuclear Fuel Cycle				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA ELECTRICA Y ENERGETICA
Name of lecturer	FERNANDO DELGADO SAN ROMAN
E-mail	fernando.delgado@unican.es
Office	E.T.S.I. Industriales y Telecomunicación. Planta: - 2. DESPACHO PROFESOR (S2030)
Other lecturers	MANUEL JOSE IBARRA ARENADO

3.1 LEARNING OUTCOMES
- Knowledge of the economic sectors related with nuclear engineering
- Knowledge of the nuclear power plant new generations
- Knowledge of the new research lines in nuclear engineering

4. OBJECTIVES
- To provide students a advanced knowledge about a current energy source, the nuclear power. - To train students for professional practice in a sector with demand of technicians graduated or postgraduated.

6. COURSE ORGANIZATION

CONTENTS	
1	SECTION I. Advanced Knowledge in Nuclear Physics
2	SECTION II. Nuclear Fuel
2.1	The nuclear fuel cycle
2.2	Treatment of the nuclear waste
2.3	The centralized temporary repository (ATC)
3	SECTION III. Advanced nuclear reactors
3.1	Advanced fision reactors (4º Generation)
3.2	Fusion reactor. ITER
4	SECTION IV. Industrial Applications
5	SECTION V. Metrology and Standars

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Answering theoretical questions	Activity evaluation with Virtual Media	No	No	15,00
Final exam	Written exam	Yes	Yes	50,00
Simulation practices	Activity evaluation with Virtual Media	No	Yes	25,00
Complementary activities	Others	No	No	10,00
TOTAL				100,00

Observations

The student will be assessed as follows:
• Simulation practices
The value of these practices is 25% of the total grade.
Several simulations have to be carried out by the pupils by using a simulation tool of a PWR reactor.
• Answering theoretical questions
The value of these questions is 15% of the total grade.
Pupils have to answer several theoretical questions in order to evaluate their progress in the knowledge of the subject.
• Final exam
The value of this test is 50% of the total grade.
At the final of the semester, the student knowledge about the subject will be checked with this test.
• Complementary activities
The value of these activities is 15% of the total grade.
These activities will include visits to nuclear power plants or to industries related with this sector, the attendance to seminars taught by nuclear experts, etc.

Observations for part-time students

The assessment of the part-time students will be carried out according the Assessment Regulation of the UC

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
- Nuclear physics and reactor theory. DOE fundamentals hanbook. Vol. 1 y 2. U.S. Department of Energy. 2009 - Introduction to Nuclear Engineering. John R. Lamarsh, Anthony J. Baratta. Editorial: Prentice Hall, 3ª Ed. 2001