

SUBJECT TEACHING GUIDE

G612 - Further Nuclear Engineering and Nuclear Fuel Cycle Degree in Energy Resources Engineering

Academic year 2019-2020

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	CRISTINA FERNANDEZ DIEGO				
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Office					
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 (4° 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	60,00
Simulation practices	Activity evaluation with Virtual Media	No	Yes	25,00
TOTAL				100,00
Observations				
<p>The student will be assessed as follows:</p> <ul style="list-style-type: none"> • Simulation practices <p>The value of these practices is 25% of the total grade.</p> <p>Several simulations have to be carried out by the pupils by using a simulation tool of a PWR reactor.</p> <ul style="list-style-type: none"> • Answering theoretical questions <p>The value of these questions is 15% of the total grade.</p> <p>Pupils have to answer several theoretical questions in order to evaluate their progress in the knowledge of the subject.</p> <ul style="list-style-type: none"> • Final exam <p>The value of this test is 60% of the total grade.</p> <p>At the final of the semester, the student knowledge about the subject will be checked with this test.</p> <ul style="list-style-type: none"> • Complementary activities <p>After attending the activity, the student must answer a series of questions about said activity in the final exam of the June session or in the September exam.</p> <p>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.</p> <p>If the minimum grade (5 out of 10) required in the sections 'Simulation practices in the classroom' and 'Final examination of the subject' is not exceeded, the final grade of the subject will be the minimum of these two values: 4.9 and the average obtained weighing all the evaluation activities. The notes of the approved parts will be kept until the extraordinary call of September.</p>				
Observations for part-time students				
<p>Part-time students will be assessed as follows:</p> <ul style="list-style-type: none"> -Attendance to the simulation practices, having to satisfactorily overcome them according the same criteria established for full-time students. Percentage value of this test over the final grade: 40%. -Performing the examination in official date. Percentage value of this test over the final grade: 60%. 				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

- Nuclear physics and reactor theory. DOE fundamentals handbook. 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