SUBJECT TEACHING GUIDE

G728 - Introduction to Nuclear Energy

Degree in Industrial Technologies Engineering

Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	Degree in Industrial Technologies Engineering			Type and Year	Optional. Year 4
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Electrical Energy Optional Module				
Course unit title and code	G728 - Introduction to Nuclear Energy				
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. de Ingenieros Industriales y de Telecomunicación. Planta: - 2. DESPACHO PROFESOR (S2030)
Other lecturers	CRISTIAN OLMO SALAS

3.1 LEARNING OUTCOMES

- - Basic knowledge of nuclear physics principles
  - Critical thinking skills
  - Independent learning ability

4. OBJECTIVES

- To provide students a basic/medium 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. SUBJECT PROGRAM	
CONTENTS	
1	SECTION I. Introduction to Nuclear Engineering
1.1	Types of reactor
1.2	Nuclear fuels
1.3	Nuclear waste
2	SECTION II. Atomic and Nuclear Physics
3	SECTION III. Reactor Theory
3.1	Neutron properties
3.2	Nuclear parameters
3.3	Reactor operation
4	SECTION IV. Nuclear Safety and Radiation Protection
5	SECTION V. Medical and Industrial Applications of Radionuclides and Ionizing Radiation.

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Simulation practices	Activity evaluation with Virtual Media	No	Yes	25,00
Final exam	Written exam	Yes	Yes	60,00
Complementary activities	Others	No	No	15,00
TOTAL				100,00

Observations

The student will be assessed as follows:
• Two midterm exams:
Each exam counts 30% of the final grade.
Each exam covers approximately half of the theoretical content taught.
The exams allow students to clear material for the final exam, and passing each exam requires a score of 5 out of 10. Grades for passed exams will be retained until the special session.
• Simulation Practices:
This exam counts 30% of the final grade (20% attendance at practicals with success + 5% practice report).
• Final Exam:
This final exam counts 30% of the final grade for retaking any exams not passed throughout the course.
To retake each exam, students must score 5 out of 10 on each exam independently.
Each retake (first and/or second exam) counts 30% of the final grade.
Students who do not meet the continuous assessment requirement (attendance and completion of 8/10 simulation hours) will be entitled to recover this part by completing a simulation practice session, to be chosen by the instructor from among those completed throughout the course.
Both parts—theory and simulation—can be recovered in the regular exam session. If not, they can be recovered in the extraordinary exam session.
• Complementary activities:
The maximum contribution of this part to the final grade will be 15%.
These activities will consist of visits to industries, seminars given by professionals in the sector, etc.
After attending the activity, the student must answer a series of questions about it in the second exam and/or final exam of the regular exam session.
Note: Online assessment of assignments, practical laboratory exercises, and written tests is planned in the event that a new COVID-19 health alert makes it impossible to complete the assessment in person.

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