

COURSE NAME

Name: **NUCLEAR ENERGY**

Code: 101214

Curriculum: **DEGREE IN ENERGY ENGINEERING AND MINERAL RESOURCES AND UNIVERSITY MASTER'S DEGREE
IN MINING ENGINEERING** Year: 4

Name of the module to which it belongs: SPECIFIC TO ENERGY RESOURCES, FUELS AND EXPLOSIVES

Subject: NUCLEAR ENERGY

Nature: OBRIGATORY Duration: FIRST SEMESTER

ECTS Credits: 6

Classroom hours: 60

Face-to-face classroom percentage: 40%

Non-contact hours: 90

FACULTY DETAILS

Name: RODERO SERRANO, ANTONIO ADOLFO (Coordinator)

Department: PHYSICS

area: APPLIED PHYSICS

Location of the office: Physics department. First floor

E-Mail: fa1rosea@uco.es

Phone number: 957213025

SKILLS

CB1	Have and understand specific knowledge of the field of study of mining engineering.
CB2	Have and understand current and cutting-edge knowledge of the field of mining engineering.
CB3	Be able to apply the knowledge acquired in professional contexts and to elaborate and defend arguments in the field of knowledge of mining engineering.
CB4	Solve problems within the study area of Mining Engineering.
CB6	Transmit information, ideas, problems and solutions to both specialized and non-specialized audiences.
CB7	Possess learning skills necessary to undertake further studies with a high degree of autonomy.
CU2	Know and refine the user level of ITs
CERE6	Nuclear engineering and radiation protection.
CERE10	Quality control of the materials used.

OBJECTIVES

- Be familiar with the basic concepts of Quantum Physics and understand the limitations of Classical Physics for analysing the atom and the atomic nucleus.
- Understand the different systems used to produce radionuclides and ionising radiation.
- Understand and justify the use of nuclear processes for medical and industrial applications (energy and non-energy).
- Be aware of the risks associated with radiation and, by extension, those associated with nuclear facilities.
- Study how to detect and measure radiation.
- Analyse the nuclear fuel cycle.
- Understand the characteristics of advanced fission reactors and fusion reactors.

CONTENTS:

1. Theoretical contents

- 1.- RADIOACTIVITY AND RADIATION PROTECTION.
- 2.- NUCLEAR FISSION.
- 3.- NUCLEAR FUEL.
- 4.- NUCLEAR FISSION REACTORS
- 5.- RADIOACTIVE WASTE TREATMENT
- 6.- APPLICATIONS AND FUTURE OF NUCLEAR ENERGY. NUCLEAR FUSION.

2. Practical contents.

STUDY OF PRACTICAL CASES RELATED TO THE THEORY