

Course guide

240NU023 - 240NU023 - Project II

Last modified: 16/05/2023

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 748 - FIS - Department of Physics.

Degree: MASTER'S DEGREE IN NUCLEAR ENGINEERING (Syllabus 2012). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 3.0 **Languages:** English

LECTURER

Coordinating lecturer: Cortes Rossell, Guillem Pere

Others: Cortes Rossell, Guillem Pere
Prete! Sanchez, Maria Del Carmen

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. Ability to select the most appropriate components and materials for the nuclear island systems of a plant as well as to analyze its degradation as a result of the conditions (thermal, chemical, mechanical and radiation) to which they are subjected.
2. Ability to write the main systems of a nuclear power plant and identify the main features of such systems.
3. Ability to identify the different tasks of the technical and financial management of a nuclear facility and assess the problems associated with analyzing and proposing possible solutions.
4. Knowledge of the diagnostic techniques used in the inspection and life management of nuclear plant components.
5. Have a clear and comprehensive life cycle of facilities, from design to decommissioning of a nuclear plant.
6. Ability to correctly apply the rules of safety and conduct analysis of nuclear plant safety
7. Ability to use effectively, understand the operation and validity ranges, and interpret the results of thermal-hydraulic codes and fluid dynamic calculation.

TEACHING METHODOLOGY

The course on P2 Project is organized in some theory sessions combined with an important amount of documentation and design activities. To perform such activities cooperative learning is the most usual method complemented by some autonomous learning.

LEARNING OBJECTIVES OF THE SUBJECT

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STUDY LOAD

Type	Hours	Percentage
Hours small group	3,0	4.00
Self study	48,0	64.00
Hours large group	24,0	32.00

Total learning time: 75 h



CONTENTS

1. Overview

Description:

The selected subject is the Steam Generator. The overview of the subject is presented with the concepts needed to plan the activities.

Related activities:

Independent learning, reading of related material

Full-or-part-time: 11h

Theory classes: 1h

Self study : 10h

2. Phase I

Description:

This block includes: Operation of old steam generators (from the Engineering standpoint), Operation of old steam generators (thermal hydraulics) and Steam generator tube rupture. Each one of these three sessions brings the student to look for and to analyse technical information on the depicted topics. In a Phase I concluding session each group of students will present the advancement of their search and judgements. Technical debates will be encouraged and moderated by the lecturers

Related activities:

Searching, reading and processing the related material

Full-or-part-time: 30h

Theory classes: 10h

Self study : 20h

3. Phase II

Description:

The block includes: Decisions to be made, New steam generators design, Compatibility study, Relicensing the plant, Fuel compatibility and Installing and commissioning new steam generators. Each one of these four sessions brings the student to look for and to analyse technical information on the depicted topics. In a Phase II concluding session each group of students will present the advancement of their search and judgements. Technical debates will be encourage and moderated by the lecturers.

Related activities:

Searching, reading and processing the related material

Full-or-part-time: 36h

Theory classes: 12h

Self study : 24h

ACTIVITIES

1. PREPARING MATERIALS FOR SYNTHESIS SESSIONS (IN GROUP)

Description:

This activity aims to promote a better understanding of the topics developed in class

Material:

Material to be obtained at internet or at the library

Delivery:

At concluding sessions

Full-or-part-time: 15h

Self study: 15h

GRADING SYSTEM

FQ = CQ

FQ: Final Qualification

CQ: Class qualification. This qualification is obtained weighting the different activities performed using the proportion of hours of each topic related to the total amount of hours of the course. The mentioned activities (information search, presentations, reports and debates) will be identified as specific assignments (some group assignments and some individual ones).

During the spring semester of the 2019-2020 academic year, and as a consequence of the COVID19 health crisis, the qualification methodology will be the same as that planned before this situation. Planned class activities will continue as remote synchronous sessions. These sessions involve the realization and delivery of synchronous tasks, which can be complemented later.