

Academic Year: ( 2022 / 2023 )

Review date: 14-06-2022

Department assigned to the subject: Physics Department

Coordinating teacher: SANCHEZ FERNANDEZ, LUIS RAUL

Type: Compulsory ECTS Credits : 6.0

Year : 2 Semester : 2

**REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)**

First year master courses, mainly basic plasma physics, experimental techniques (plasmas, materials and nuclear physics) and computational physics.

**OBJECTIVES**

The students will carry out during two weeks two Hand-on experiments (one per week) in the ITER site (in Cadarache). It is expected that the students acquire practical training in topics relevant to the nuclear fusion field.

**DESCRIPTION OF CONTENTS: PROGRAMME**

The students receive practical training on relevant topics within the nuclear fusion field during two weeks in the ITER site (Cadarache; France) in the beginning of the second semester (February).

Two Hands-On subjects are attributed to each student (one per week). The list of topics is:

- 1- Lower Hybrid mode conversion
- 2- Qualification of PFC (Plasma Facing Components)
- 3- Thermo-desorption
- 4- Glow discharge characterization
- 5- Reflectometry
- 6- Tokamak experiment COMPASS
- 7- Tokamak experiment Golem
- 8- Experimental data analysis Tore Supra
- 9- Numerical models
- 10- Integrated modelling

**LEARNING ACTIVITIES AND METHODOLOGY**

Hands On work (two weeks in February). Organization:

The students are grouped by 2. Two Hands-On subjects are attributed to each student. The attribution of the subjects is something we pay particular attention to. The objective is that everybody gets the subject he/she is the most interested in, and we want to take into account the student's choice in the attribution of the subjects. However, fulfilling everybody's wishes may turn out to be something tricky. The following method is used:

1. The list of available subjects, together with a short description of the scientific content of each subject and the number of students it can take is sent to the students.
2. Each student sends back the list of subjects with a ranking, corresponding to the priority they give to each subject. The ranking has to be done for the full list of subjects, not only indicate top 2 or 3 subjects.
3. We prepare the distribution of subjects among the students. We will pay a particular attention to take into account the student's wishes, but again, we don't guaranty everybody will be given his top 1 or 2 subjects. The groups of 2 students will be formed here, based on the subject priority list of each student. We release the table of attribution of subjects. This table will also indicate the grouping of

students (by 2). Swapping may then be requested.

4. The updated table indicating the attribution of subjects and the groups of 2 students and the groups of 2 students is released.

This assignment of the Hand-on experiments (steps 1 - 4) is carried out before they reach Cadarache so that they can get some familiarity with the topics in advance and start soon the work once they are in the laboratory.

The experiments are supervised by personnel of the laboratory and lecturers of the master participating in the event.

## ASSESSMENT SYSTEM

\* Work done in the 1st week:

Written document handed on Monday of the second week. One document/ group of 2 students.

\* Work done in the 2nd week:

oral presentation (last Friday) in front of a committee made of the experiment supervisors and lecturers of the master; 30mn are given to each group, divided in 20mn talk (10mn/student) + 10mn questions. The presentations are prepared on the Thursday before.

\* Guidelines for document/talk preparation:

The document for the 1st week work, and the talks, for the 2nd week are expected to present:

- the subject of the work, its scientific relevance for fusion
- the description of the method that has been used to study this subject, results
- what would you propose to go further into the subject (follow-up?)

The written document should not exceed 4 pages, including figures. The talks should not exceed ~10 slides, ~5 slides/student. The final mark is the mean value of the marks obtained for the written document, and the oral report.

Each student obtains an individual mark.

<b>% end-of-term-examination:</b>	100
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	0

## BASIC BIBLIOGRAPHY

- Reports prepared by, the supervisors.