# GUÍA DOCENTE ABREVIADA DE LA ASIGNATURA

## G1775 - Advanced Experimental Techniques (2C)

## Doble Grado en Física y Matemáticas
## Grado en Física

Curso Académico 2023-2024

| 1. DATOS IDENTIFICATIVOS | | | | |
|---|---|---|---|---|
| Título/s | Doble Grado en Física y Matemáticas<br>Grado en Física | | Tipología y Curso | Optativa. Curso 4<br>Optativa. Curso 4 |
| Centro | Facultad de Ciencias | | | |
| Módulo / materia | MATERIA TÉCNICAS EXPERIMENTALES AVANZADAS<br>MÓDULO TRANSVERSAL FÍSICA FUNDAMENTAL / FÍSICA APLICADA | | | |
| Código y denominación | G1775 - Advanced Experimental Techniques (2C) | | | |
| Créditos ECTS | 6 | Cuatrimestre | Cuatrimestral (2) | |
| Web | | | | |
| Idioma de impartición | Inglés | | Forma de impartición | Presencial |

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| Departamento | DPTO. FISICA APLICADA |
| Profesor responsable | FRANCISCO GONZALEZ FERNANDEZ |
| E-mail | francisco.gonzalezf@unican.es |
| Número despacho | Facultad de Ciencias. Planta: + 3. DESPACHO (3043) |
| Otros profesores | MANUEL PEREZ CAGIGAL<br>ANGEL ALBERTO VALLE GUTIERREZ<br>JOSE IGNACIO ESPESO MARTINEZ<br>PABLO ALBELLA ECHAVE<br>ANA QUIRCE TEJA<br>JESUS MANUEL VIZAN GARCIA<br>GUILLERMO SERRERA PARDUELES |

| 3.1 RESULTADOS DE APRENDIZAJE |
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| - - Use of advanced experimental setups and knowledge in instrumentation control. |
| - - Knowledge of basic elements of different experimental devices , their physical principles and applications. |
| - - Being able to choose the proper experimental technique to unveil the physics of a given experimental problem. |
| - - Knowing to properly analyse and discuss the experimental data. Being able to fit these experimental data by using existing software or by developing new one. Being accurate in data discussion and, if possible, comparing these data with already known results. |
| - - Development of technical accounts in English, in order to integrate them into the scientific report of an experiment. |
| - - Being able to carry out an oral presentation in English, over a fixed limited time, of one of the experimental projects. |

| 4. OBJETIVOS |
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| - The main goal of the subject is that the student will carry out four different projects (from different topics in Physics) at an advanced level. |
| - It is expected that the student will get lab skills, will know material with general and specific purposes and will deepen into the experimental data treatment (data acquisition, graphical representation, fit to theoretical models, etc.). |
| - It is advisable that the student will arrive to properly manage as a speaker when presenting, in English, one of the led projects. |

| 6. ORGANIZACIÓN DOCENTE | |
|---|---|
| CONTENIDOS | |
| 1 | To carry out one of the following experimental projets:<br>- Analysis of a Luminous Signal with Deterministic Profile by using Photon Counting Techniques (Poject 1).<br>- Shack-Hartmann Wavefront Sensor (Project 2).<br>- Ferromagnetic materials characterization (hysteresis loops) (Project 3).<br>- Neutron detection. Measue of the Thermal Neutron Flux of an Am-Be Neutron Source (Project 4) |
| 2 | To carry out one of the following experimental projets: - Shack-Hartmann Wavefront Sensor (Project 2). - Ferromagnetic materials characterization (hysteresis loops) (Project 3). - Neutron detection. Measue of the Thermal Neutron Flux of an Am-Be Neutron Source (Project 4).<br>- Advanced characterization of semiconductor lasers (Project 5) |
| 3 | To carry out one of the following experimental projets: - Ferromagnetic materials characterization (hysteresis loops) (Project 3). - Neutron detection. Measue of the Thermal Neutron Flux of an Am-Be Neutron Source (Project 4). - Advanced characterization of semiconductor lasers (Project 5).<br>- Analysis of a Luminous Signal with Deterministic Profile by Using Photon Counting Techniques (Project 1) |
| 4 | To carry out one of the following experimental projets: - Analysis of a Luminous Signal with Deterministic Profile byUsing Photon Counting Techniques (Project 1). - Shack-Hartmann Wavefront Sensor (Project 2). -Ferromagnetic materials characterization (hysteresis loops) (Project 3). - Advanced characterization of semiconductor lasers (Project 5) |

## 7. MÉTODOS DE LA EVALUACIÓN

| Descripción | Tipología | Eval. Final | Recuper. | % |
|---|---|---|---|---|
| Coninuos Evaluation: Oral presentation | Otros | No | Sí | 12,00 |
| Continuous Evaluation: Delibery of Reports | Otros | No | Sí | 88,00 |
| TOTAL | | | | 100,00 |

Observaciones

METODOLOGÍA:
- Los alumnos estarán agrupados en diferentes grupos, que serán establecidos al comienzo del cuatrimestre.
- Cada alumno, deberá de realizar cuatro prácticas de las ofertadas, según el criterio del profesor responsable de la asignatura.
- De cada una de las prácticas, se deberá de realizar un informe en inglés que se le entregará al profesor correspondiente.
- Cada alumno expondrá de forma oral y pública una de las prácticas que le asigne el profesor responsable de la asignatura.

EVALUACIÓN:
- El plazo de presentación de los informes será de una semana desde el momento en que finalice la última sesión de la práctica. Habrá una penalización de 1 punto sobre 10 por retrasos de hasta una semana, 3 puntos sobre 10 por retrasos de hasta 2 semanas y los retrasos superiores llevarán aparejada una calificación de 0 en esa práctica, aunque seguirá siendo obligatoria su entrega.
- La presentación oral (15 minutos) tendrá carácter obligatorio para todos los alumnos.
- Será obligatorio finalizar todas las prácticas y enviar todos los informes para aprobar la asignatura
- Los informes de las prácticas tendrán un peso relativo del 22%, cada una, en la nota final.
- La presentación oral tendrá un peso de un 12% en la nota final.

RECUPERACION
- Para poder acceder a la convocatoria extraordinaria, el alumno deberá de completar las prácticas que le faltan hasta el número previsto (4) en las condiciones que le establezca el profesor responsable de las prácticas. Después deberá superar un examen escrito a realizar en las fechas previstas por el Centro para la convocatoria extraordinaria.

METHODOLOGY
- The students will be divided into several groups that will be organized at the beginning of the semester.
- Each student will carry out four projects  selected by the encharged person of the subject.
- The student will have to write down a report, in English, of any of the finished projects. The report will be delivered to the corresponding teacher.
- Each student will perform a public oral presentation on a particular project that will be selected by the responsible of the subject.

EVALUATION
- The deadline for each report will be one week from the end of the last session of the corresponding project. There will be a penalty of 1 over 10 points for delays up to one week, 3 over 10 points for delays up to 2 weeks and a further delay will involve a mark of 0 on that project, although it will still be compulsory to submit the report.
- The oral presentation (15 minutes) will be compulsory for all the students.
- It will be compulsory to submit the reports on the four projects to pass the subject.
- The reports of the projects will weigh 22% each one on the final mark.
- The oral presentation will weigh 12% on the final mark.

RE-EVALUATION
-To access the resit, the student has to complete the missing practices to the expected number (4) under the conditions set by the teacher responsible for the practices. Then, the student must pass a written exam to be taken on the dates set by the Centre for the extraordinary exam.

Criterios de evaluación para estudiantes a tiempo parcial

As far as possible, we will try to adapt schedules so that students can carry out the four experimetal projects.

## 8. BIBLIOGRAFÍA Y MATERIALES DIDÁCTICOS

BÁSICA

- Due to the specific characteristics of the present subject, the basic bibliography will be contained in the guide of eachproject that will be provided at the beginning of the course.

Esta es la Guía Docente abreviada de la asignatura. Tienes también publicada en la Web la información más detallada de la asignatura en la Guía Docente Completa.