

COURSE GUIDE

2025/26

Faculty 345 - Faculty of Engineering - Bilbao

Degree DIPRO13a - Master in Project Management

Cycle .

Year .

COURSE

504913 - Tools for problem solving in research projects

Credits, ECTS: 3

COURSE DESCRIPTION

This course will allow the planning and execution of advanced research to generate knowledge in different fields and disciplines related to engineering. The steps to be followed to carry out a Research Project will be seen: sampling design, design of experiments and selection of statistical techniques for data analysis), using new ICT tools.
In this course we will work with survey tools, oriented to social research.

COMPETENCIES/LEARNING RESULTS FOR THE SUBJECT

COMPETENCIAS DE LA ASIGNATURA

To apply and develop the methodologies, technologies and tools used in research in the discipline of project management.

RESULTADOS DE APRENDIZAJE DE LA ASIGNATURA

- The student who successfully completes this subject should be able to:
- Understand the basic social research techniques, both quantitative and qualitative.
 - Apply statistical techniques of data analysis for social research.
 - Solve simple exercises, with or without specific software, of data analysis.

Theoretical and Practical Contents

Introduction. Basic concepts. Project management
Problem formulation. Selection of variables. Data collection. Techniques for conducting a DoE
Statistics for research. Data representation and correlations. Case studies using different software.

METODOLOGIA (ACTIVIDADES FORMATIVAS)

Actividad Formativa	Hours	Porcentaje presencialidad
Expositive classes	30	33 %
Exercises	45	10 %

TYPES OF TEACHING

Types of teaching	M	S	GA	GL	GO	GCL	TA	TI	GCA
Hours of face-to-face teaching	10		10		10				
Horas de Actividad No Presencial del Alumno/a	10		10		25				

Legend: M: Lecture-based S: Seminar GA: Applied classroom-based groups
GL: Applied laboratory-based groups GO: Applied computer-based groups GCL: Applied clinical-based groups
TA: Workshop TI: Industrial workshop GCA: Applied fieldwork groups

Evaluation tools and percentages of final mark

Denominación	Ponderación mínima	Ponderación máxima
Attendance and participation	10 %	40 %
Written examination	0 %	50 %
Practical tasks	20 %	60 %

ORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

The assessment of the subject is carried out continuously throughout the course.
The following factors are taken into account in the grading of the course:
Attendance (10%): Although attendance is not compulsory, it is highly recommended due to the contents developed in the classroom. For this reason, attendance forms part of the calculation of the final grade.
Individual and/or team assignments (40%): Students must hand in an assignment designated at the beginning of the course. The work will be handed in by uploading it to egela within the defined deadlines. In order to pass the course, the work must have obtained a grade higher than 5 out of 10.
Exam (50%): As in the certification exams of the professional associations of project management, the exam will be in the form of a multiple-choice test. In order to pass the course, the work must have obtained a grade of more than 4 out of 10.
The grade for the course will be obtained by applying the corresponding weight to each of the factors (attendance, individual work, team work, exam).



If any of the work (individual or team work) has not passed the established cut-off mark, the final mark for the course will be No Show.

If the exam mark is lower than 4.0, the final mark for the course will be that corresponding to the exam mark.

If the student decides to waive the Continuous Assessment of this subject, he/she must communicate it in writing before the deadline for the submission of the individual work. This date can be found in the Student Guide available on the eGela platform.

In this case, in order to pass the course, the student will be assessed by means of a written exam that may contain additional questions to those posed in the exam to which students who are assessed on a continuous basis are submitted and which will include all the contents studied throughout the four-month period corresponding to the exam. This assessment will be completed with an oral exam which will take place on the same day as the written exam, by prior appointment for students registered for this exam. In the oral exam, students will be asked about the contents studied in the classroom, as well as about the activities carried out during the corresponding four-month period. In order to pass the course, students must pass both tests.

In the event that health conditions prevent the completion of a teaching activity and/or face-to-face assessment, a non-face-to-face modality will be activated, of which students will be promptly informed (applicable to all exams: ordinary, extraordinary and advance).

EXTRAORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

Those who have to sit the extraordinary call will do so in the same way as they did in the ordinary call. In other words, those who took the continuous assessment will complete the tests (individual work, team work, exam) that they did not pass in the ordinary call.

The grade for the course will be obtained by applying the corresponding weight to each of the factors (attendance, individual work, team work, exam).

If any of the work (individual or team work) has not passed the established cut-off mark, the final mark for the course will be No Show.

If the exam mark is lower than 4.0, the final mark for the course will be that corresponding to the exam mark.

Those who waive the continuous assessment, will be submitted to a written and oral exam as described in the previous section (Ordinary call: orientations and waiver).

MANDATORY MATERIALS

The course is managed through the egela platform. Here the student will find the transparencies used in class and other help materials. The statements of individual and team assignments will also be found there, and the places where to upload them.

BIBLIOGRAPHY

Basic bibliography

Kumar, R.; Research methodology. A step-by-step guide for beginners. Sage, 2011.

Singh, Y.K.; Fundamental of Research methodology and Statistics. New age International (P) Ltd., Publishers, 2006.

Jiju Antony. Design of Experiments for Engineers and Scientists . ISBN: 978-0-7506-4709-0

Detailed bibliography

HOWARD, N.: ¿Least Squares Clasiffication and Principal Component Analysis: A Comparison¿ en DOGGAN, M. & ROKKAN, S. (Eds.) ¿Quantitative Ecological Analysis in the Social Sciences¿. MIT Press. Cambridge, 1969 (pp. 397-412).

Kothari, C.R.; Research methodology. Methods and techniques. New age International (P) Ltd., Publishers, 2004.

Pandey, P, Pandey, M.M.; Research methodology: tools and techniques. Bridge center, 2015.

Kohl, M.; Introduction to statistical data analysis with R. bookboon.com, London, 2015. ISBN 978-87-403-1123-5.

Bloomfield, V.A.; Using R for Numerical Analysis in Science and Engineering. Chapman & Hall/CRC, 2014. ISBN 978-1439884485

Journals

Web sites of interest

<https://www.r-project.org/>