GENERAL INFORMATION					
Course name	SI1. Advanced materials characterization technologies				
Semester	2	Character	Optional	Type of module	Specialisation
ECTS	5		Modality	Face-to-face	
Higher Education Institution(s)	Mondragon Unibertsitatea				
Lecturer(s)	Alaitz Zabala Joseba Mendiguren DanielBernal Mikel Cuesta				

LEARNING AND TEACHING	
ESCO Occupation(s)	Manufacturing engineer Calculation engineer
ESCO Skill & Competences (*no ESCO)	Test materials Develop test procedures Operating scientific and laboratory equipment Metrology
Learning outcomes (Please refer to Appendix 4 for the interpretation of the acronym)	EP3 EP4 IN4
• Teaching methods	Lectures. Worskshop Tutorials. Case Studies.
Assessment methods	Examinations. Lab experiments Technical report

CONTENTS

Previous requirements (if necessary)

Content index

- ADVANCED TRIBOLOGY: fundamentals, tesing, laboratory
- SURFACE CHARACTERIZATION: surface metrology, surface integrity, surface residual stress
- TEMPERATURE AND STRAIN RATE MATERIAL CHARACTERIZATION: uniaxial, biaxial testing, DIC...
- RECRISTALIZATION AND GRAIN GROWTH CHARACTERIZATION : EBSD, SEM…
- MICROSTRUCTURAL EVOLUTION WITH TEMPERATURE: XRD
- THERMOPHYSICAL PROPERTIES AND THERMOGRAPHY: DSC, Laser Flash, Dilatometer; Emissivity, HTC…
- METROLOGY: Dimensional and geometrical metrology

SUPPORTING BIBLIOGRAPHIC REFERENCES

- Tribology in Materials and Applications. DOI: https://doi.org/10.1007/978-3-030-47451-5
- Optica Measurement of Surface Topography. Chaper1 Introductyion to Surface Texture Measurement. **DOI**: https://**doi**.org/10.1007/978-3-642-12012-1
- Huang, K. E., & Logé, R. E. (2016). A review of dynamic recrystallization phenomena in metallic materials. *Materials & Design*, *111*, 548-574.
- Leach, R., Ferrucci, M., & Haitjema, H. (2020). Dimensional metrology. CIRP Encyclopedia of Production Engineering, 1st ed.; Laperrière, L., Reinhart, G., Eds.
- Mutilba, U., Gomez-Acedo, E., Kortaberria, G., Olarra, A., & Yagüe-Fabra, J. A. (2017). Traceability of on-machine tool measurement: a review. Sensors, 17(7), 1605.

SOFTWARE

- METROLOGY Software: MCOSMOS, FORMTRACEPAK & IF-MeasureSuite