

Academic Year: (2020 / 2021)

Review date: 10-07-2020

Department assigned to the subject: Materials Science and Engineering and Chemical Engineering Department

Coordinating teacher: CAMPOS GOMEZ, MONICA

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Materials Science and Engineering
Materials technology

OBJECTIVES

To get knowledge on the technologies that allows to obtain materials from powders and to provide to the student selection criteria that permit them to choose among alternative technologies.

To get knowledge about different powder materials: clasification, processing, properties,...Selection criteria.

DESCRIPTION OF CONTENTS: PROGRAMME

- PM Global Concept. PM as an alternative
- Powder Manufacturing & Characterization
- Shaping Technologies
- Sintering fundamentals
- PM low alloyed steels. Liquid Phase Sintering
- Special PM steels
- Hardmaterials & cermets
- PM Light Alloys
- Porous Materials
- Advances Methods in PM

LEARNING ACTIVITIES AND METHODOLOGY

Practical sessions will include:

- Supervised labs. To follow these labs is mandatory. The completed handbooks must be done after one week of the final day of the labs.
- Supervised works. It value is 25% of the total mark. It will include the manufacturing and charaterization of a PM steel, as well the definition of the processing parameters of a real PM part.

ASSESSMENT SYSTEM

Collaborative works: 30%

Lab practice, reports, and experimental work 30%

Final examination: 40%

% end-of-term-examination:	40
% of continuous assessment (assignments, laboratory, practicals...):	60

BASIC BIBLIOGRAPHY

- Collective ASM Handbook vol. 7.. Powder Metal Technologies and Applications.., ASM, , 1998.
- M. Rhodes Principles of Powder Metallurgy., Wiley, 1997
- R.M. German.. Sintering Theory and Practice.., Wiley, , 1996
- W. Schatt & K.P. Wieters Powder Metallurgy, processing and materials., EPMA, 1997.

ADDITIONAL BIBLIOGRAPHY

- Fernand D. S. Marquis Powder Materials: Book 3 : Current Research and Industrial Practices, The Minerals, Metals & Materials Society , 2010
- Martin Rhodes Introduction to Particle Technology , wiley.
- R. German Sintering Theory and Practice , Wiley.
- Randall M. German, Pavan Suri, Seong Jin Park Review: liquid phase sintering, DOI: 10.1007/s10853-008-3008-0, 2008