

Forming of metals

Titulaire

Stephane GODET (Coordonnateur)

Mnémonique du cours

CHIM-H532

Crédits ECTS

4 crédits

Langue(s) d'enseignement

Anglais

Période du cours

Deuxième quadrimestre

Contenu du cours

The content of the course is as follows:

- > reminder of continuum mechanics and plasticity under mutiaxial loading
- > Forming limit diagrams
- > Texture and anisotropy
- > Annealing phenomena: static and dynamic recrystallization
- > Rolling and controlled rolling
- > Extrusion
- > Deep drawing

The industrial visits consists in 6 visits in 3 days illustrating varioy-us aspects of materials technology; Exemples are: ASCO,Materialize, AGC Glass Europe production site, Safran,...

Objectifs (et/ou acquis d'apprentissages spécifiques)

The objective of this course is to help the students mobilize their skills at the microstrural scale (bulk and surface) in order to understand the modern forming technologies. At the end of this course the students should be able to

- > Explain the different forming operations with their strong points and drawbacks
- > Unsderstand and explain how both surface and bulk properties are affecting the final product
- > Explain how the technological and processing parameters canbe tuned to optimize the properties and related microstructure of the final part
- > Discuss the importance of material's anisotropy during forming operations

Méthodes d'enseignement et activités d'apprentissages

Lectures are given using PPT slides

Contribution au profil d'enseignement

This teaching unit contributes to the following competences:

- > In-depth knowledge and understanding of exact sciences with the specificity of their application to engineering
- > Correctly report on research or design results in the form of a technical report or in the form of a scientific paper
- > Present and defend results in a scientifically sound way, using contemporary communication tools, for a national as well as for an international professional or lay audience
- > Work in an industrial environment with attention to safety, quality assurance, communication and reporting
- > The flexibility and adaptability to work in an international and/ or intercultural context
- > An integrated insight in materials' technology

Références, bibliographie et lectures recommandées

Kalpakjian, Serope ; Schmid, Steven R ; Vijai Sekar, K S, Manufacturing engineering and technology, 2014, ISBN 9789810694067

Autres renseignements

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Méthode(s) d'évaluation

Examen oral

Méthode(s) d'évaluation (complément)

Oral exam

Construction de la note (en ce compris, la pondération des notes partielles)

100% of the oral exam

Langue(s) d'évaluation principale(s)

Anglais

Programmes

Programmes proposant ce cours à l'école polytechnique de Bruxelles

MA-IRMA | Master : ingénieur civil en chimie et science des matériaux | finalité Spécialisée/bloc 2

