Surface treatment : processing and analysis

Titulaires
Iris DE GRAEVE (Coordonnateur) et Tom Hauffman

Mnémonique du cours
CHIM-H419

Crédits ECTS
4 crédits

Langue(s) d'enseignement
Anglais

Période du cours
Premier quadrimestre

Campus
Solbosch et Plaine

Contenu du cours

The class is splitted into two main topics: one part on surface modification processes and the other on surface analysis. The course is given by three professors Tom Hauffman (VUB), Iris De Graeve (VUB) and Marie-Paule Delplancke (ULB). Surface processing is approached from different point of views : mechanical treatments, electrochemical and chemical treatments and plasma processing (low and high pressures). The processes are discussed in details in relation to the used reactor. Various materials are considered : metals, ceramics, polymers and hybrid coatings.

In the surface analysis part, the interaction between beams (photon, electron, ion) and the material are considered relation with the analytical methods: Auger and photoelectron spectroscopies, secondary ion mass spectroscopy as well local probe methods.

Objectifs (et/ou acquis d'apprentissages spécifiques)

This course can be considered as class where the student is using the knowledge acquired in other courses about materials (metals , polymers, ceramics and composites), physics, chemistry and reactor technology but this time it is focused on surface technology. The mini-project (practical part) implies application of the theoretical knowledge to a new research subject and the development of critical mind.

Méthodes d'enseignement et activités d'apprentissages

ex-cathedra classes and group project.

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
- Collaborate in a (multidisciplinary) team
- A creative, problem-solving, result-driven and evidence-based attitude, aiming at innovation and applicability in industry and society
- The flexibility and adaptability to work in an international and/or intercultural context
- An attitude of life-long learning as needed for the future development of his/her career
- An integrated insight in chemical process and materials' technology
- Insight in chemistry as a link between process and materials technology

Support(s) de cours

Université virtuelle

Autres renseignements

Lieu(x) d'enseignement

Solbosch et Plaine

Contact(s)

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Méthode(s) d'évaluation

Autre

Méthode(s) d'évaluation (complément)

oral examination with each professor on the same day

team written report for the mini-project

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

40% for the mini-project (20% for the individual contribution during the quadrimester and 20% group mark for the group report)

60% for the oral exams (20% for each professor)

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 1