Cours: Science et génie des matériaux

Sem.: MA1, MA3

Type: Opt.

Language: English

Credits: 2

Session: Winter

Semester: Fall

Exam: During the semester

Workload: 60h

Weeks: 14

Hours: 2 weekly

Lecture: 2 weekly

Number of positions: 2 weekly

Summary
Discussion of topical subjects related to the current use of cementitious materials. Through a guided literature survey prepare a presentation in a group on a topical issue.

Content
1. Introduction - overview of structure of cementitious materials, advantages and disadvantages.
2. Hydration.
3. Supplementary cementitious materials.
4. Understanding and characterising the pore structure of cementitious materials.
5. Transport properties.
6. Durability issues.
7. Calcium aluminate cements.
9. Admixtures and rheology

Keywords
Cementitious materials, hydration, durability, characterisation methods

Learning Prerequisites
Required courses
MSE 322 - Building Materials and Laboratory work

Recommended courses
Building materials

Learning Outcomes
By the end of the course, the student must be able to:
- Explain Chemical and physical processes underlying the behaviour of cementitious materials
- Interpret scientific papers related to cementitious materials
- Analyze appropriateness of different characterisation techniques
- Analyze economic and ecological appropriateness of different materials solutions
- Design lecture on chosen topic

Transversal skills
• Plan and carry out activities in a way which makes optimal use of available time and other resources.
• Evaluate one's own performance in the team, receive and respond appropriately to feedback.
• Negotiate effectively within the group.
• Access and evaluate appropriate sources of information.
• Make an oral presentation.
• Summarize an article or a technical report.
• Write a literature review which assesses the state of the art.

Teaching methods
Ex cathedra
group discussion of papers from literature

Expected student activities
attend lectures
find relevant paper from search engines
present summary of findings
prepare lecture in team

Assessment methods
contribution to discussion sessions throughout course
presentation at intermediate and final stages

Supervision
Assistants Yes
Forum No

Resources
Bibliography
Via search engines, e.g. scopus

Notes/Handbook
Handouts for lectures to be annotated by students