

MSE-420

**Cementitious materials (advanced)**

Scrivener Karen

Cursus	Sem.	Type
Materials Science and Engineering	MA1, MA3	Opt.
Sustainable Construction minor	H	Opt.

Language of teaching	English
Credits	2
Session	Winter
Semester	Fall
Exam	During the semester
Workload	60h
Weeks	14
<b>Hours</b>	<b>2 weekly</b>
Courses	2 weekly
<b>Number of positions</b>	

**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.
8. Ultra high performance concrete.
9. Admixtures and rheology

**Keywords**

Cementitious materials, hydratin, 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

Assistant.e.s	Yes
Forum	No

### Resources

#### Bibliography

Via search engines, e.g. scopus

#### Notes/Handbook

Handouts for lectures to be annotated by students

#### Moodle Link

- <https://go.epfl.ch/MSE-420>