AGH UNIVERSITY OF SCIENCE AND TECHNOLOGY

Module name: Introduction to building materials engineering

Academic year: 2019/2020 Code: CIMT-1-046-s ECTS credits: 3

Faculty of: Materials Science and Ceramics

Field of study: Materials Science Specialty: —

Study level: First-cycle studies Form and type of study: Full-time studies

Lecture language: English Profile of education: Academic (A) Semester: 0

Course homepage: —

Responsible teacher: dr inż. Kotwica Łukasz (lkotwica@agh.edu.pl)

Module summary

Students will get acquainted with the issues of designing the properties of building materials such cement-based materials and building ceramics. The relationship between the microstructure of the material, its phase composition and properties, important from the point of view of the use of building materials in practice will be presented. Also the methods of shaping the microstructure and phase composition of building materials due to appropriate selection of raw materials and technologies is presented.

Description of learning outcomes for module

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Connections with FLO	Method of learning outcomes verification (form of completion)
Social competence: is able to			
M_K001	Student has knowledge and consciousness of the importance of building materials for the mankind and for environment.	IMT1A_K01	Presentation, Activity during classes
Skills: he can			
M_U001	The students will have the ability to use obtained knowledge for design and optimization of building materials on the basis of materials engineering. Students will be introduced to materials engineering of building materials.	IMT1A_U01	Presentation, Activity during classes
Knowledge: he knows and understands			
M_W001	Students will have the knowledge on the constitution of selected building materials.	IMT1A_W03	Scientific paper, Activity during classes

M_W002	Students will get knowledge on the relationships between composition, constitution and properties of building materials.	IMT1A_W03	Scientific paper, Activity during classes

Number of hours for each form of classes

	Form of classes										
Suma	Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
30	0	0	0	0	0	30	0	0	0	0	0

FLO matrix in relation to forms of classes

MLO code	Student after module completion has the knowledge/ knows how to/is able to	Form of classes										
		Lectures	Auditorium classes	Laboratory classes	Project classes	Conversation seminar	Seminar classes	Practical classes	Fieldwork classes	Workshops	Prace kontrolne i przejściowe	Lektorat
Social competence: is able to												
M_K001	Student has knowledge and consciousness of the importance of building materials for the mankind and for environment.	-	-	-	-	-	+	-	-	-	-	-
Skills: he can												
M_U001	The students will have the ability to use obtained knowledge for design and optimization of building materials on the basis of materials engineering. Students will be introduced to materials engineering of building materials.	-	-	-	-	-	+	-	-	-	-	-
Knowledge: he knows and understands												
M_W001	Students will have the knowledge on the constitution of selected building materials.	-	-	-	-	-	+	-	-	-	-	-
M_W002	Students will get knowledge on the relationships between composition, constitution and properties of building materials.	-	-	-	-	-	+	-	-	-	-	-

Student workload (ECTS credits balance)

Student activity form	Student workload
Udział w zajęciach dydaktycznych/praktyka	30 h
przygotowanie projektu, prezentacji, pracy pisemnej, sprawozdania	5 h
Realization of independently performed tasks	40 h
Summary student workload	75 h
Module ECTS credits	3 ECTS

Additional information

Module content

Seminar classes

The subject of the seminars concerns the introduction to the problem of shaping the properties of building materials such mineral binders based composites as well as building ceramics. The relationship between the microstructure of the material and its phase composition and functional properties, important from the point of view of the use of building materials in practice will be presented. Also presented are the methods of shaping the microstructure and phase composition of building materials through the appropriate selection of raw materials and manufacturing technology. The lecture focuses on the practical application of basic knowledge about materials in order to shape and improve the utility properties / cost of building materials and thus their market attractiveness.
Except mineral ceramic materials, also organic, mainly polymeric materials used as admixtures i building materials industry will be characterized, and methods of their manufacturing presented. Details of the influence of molecular structure of admixtures on their properties and efficiency are presented.

Teaching methods and techniques:

Seminar classes: Lectures, discussions, solving of problems given by teacher, oral presentations of students

Warunki i sposób zaliczenia poszczególnych form zajęć, w tym zasady zaliczeń poprawkowych, a także warunki dopuszczenia do egzaminu:

No exam. The final mark is resulted by the attendance of the student and voluntary oral presentation.

Zasady udziału w poszczególnych zajęciach, ze wskazaniem, czy obecność studenta na zajęciach jest obowiązkowa:

Seminar classes:
– Attendance is mandatory: Yes
– Participation rules in classes: Teacher presents a series of lectures describing the particular topics. Students are encouraged to take a part in the discussion. Students may give an oral presentation in order to get a higher mark.

Method of calculating the final grade

Final grade is calculated on the basis of students attendance and activity during the classes, as well as oral presentation mark. Oral presentation is not obligatory, but for those who will make it the final grade is better.

Sposób i tryb wyrównywania zaległości powstałych wskutek nieobecności studenta na zajęciach:

Students who are in arrears should contact the teacher to determine the details of the pass. Most usually it is final test or oral presentation.

Prerequisites and additional requirements

The student should speak English at the Intermediate or higher level.

Recommended literature and teaching resources

R. Pampuch, Constitution and properties of ceramic materials, Elsevier, Amsterdam, 1991
H.F.W. Taylor, Chemistry of cement, Taylor Francis, London, 1997
W. Kurdowski, Cement and Concrete Chemistry, Springer, 2013

Scientific publications of module course instructors related to the topic of the module

Additional scientific publications not specified

Additional information

If candidates have any doubts or want to get some additional informations please don’t hesitate to contact to the teacher.