Course description

Course abbreviation:	KMM/USM Introduction into the Study of Materials	Page:	1/3			
Academic Year:	2023/2024 Printed:	05.07.2025	20:57			
Department/Unit /	KMM / USM Academic Year	2023/2024				
Title	Introduction into the Study of Materials Type of completion	Exam				
Accredited/Credits	Yes, 2 Cred. Type of completion	Combined				
Number of hours	Lecture 2 [Hours/Week]					
Occ/max	Status A Status B Status C Course credit prior to	Yes				
Summer semester	0 / - 0 / - 0 / - Counted into average	YES				
Winter semester	0 / - 0 / - 0 / - Min. (B+C) students	10				
Timetable	Yes Repeated registration	NO				
Language of instruction	Czech Semester taught	Summer se	emester			
Optional course	Yes Internship duration	0				
Evaluation scale	1 2 3 4 Ev. sc. – cred .	S N				
No. of hours of on-premise						
Auto acc. of credit	Yes in the case of a previous evaluation 4 nebo nic.					
Periodicity	every year					
Specification periodicity						
Substituted course	None					
Preclusive courses	N/A					
Prerequisite courses	N/A					
Informally recommended courses N/A						
Courses depending on this Course N/A						

Course objectives:

The students will obtain overview about the fundamental type soft materials (metals, polymers, ceramics, composites), its structure, properties, methods of production, application.

Requirements on student

Exam: written test, oral exam

Content

1. Chemical bonds, fundamental type soft structures - crystalline and amorphous phase, fundamentals of crystallography, definition of the properties of materials

- 2. Metals metal bond, reactions of metals with acids (noble x base metals), pure metals
- 3. Metals equilibrium phase diagrams, metal alloys
- 4. Metals Fe and C alloys (steels, cast irons), ironless alloys
- 5. Ceramics raw materials, fundamentals of ceramic technology
- 6. Ceramics classification, properties
- 7. Ceramics bioceramics, glasses
- 8. Polymers basics, raw materials, synthesis of polymers, physical states of polymers, classification
- 9. Polymers thermoplastic polymers

- 10. Polymers resins, elastomers
- 11. Polymers nature polymers
- 12. Composite materials

Fields of study

Guarantors and lecturers				
Guarantors:	doc Ing Tomáš Křenek Ph D (100%)			
T	$\frac{1}{2} = \frac{1}{2} = \frac{1}$			
• Lecturer:	doc. Ing. Tomas Kovarik, Ph.D. (50%), doc. Ing. Tomas Krenek, Ph.D. (50%)			
Literature				
• Recommended:	Skálová, Jana; Koutský, Jaroslav; Motyčka, Vladislav. <i>Nauka o materiálech</i> . 2. vyd. Plzeň : Západočeská univerzita, 2000, ISBN 80-7082-677-0.			
 Recommended: 	Ducháček, Vratislav, Polymery : výroba, vlastnosti, zpracování, použití, Praha : Vysoká škola			
	chemicko-technologická, 1995, ISBN 80-7080-241-3.			
• Recommended:	Hanykýř, Vladimír; Kutzendörfer, Jaroslav. <i>Technologie keramiky</i> . [Praha] : Vega, 2000. ISBN 80-900860-6-3			

Time requirements

All forms of study					
Activities		Time requirements for activity [h]			
Preparation for an examination (30-60)		30			
Contact hours		26			
	Total:	56			

assessment methods

Knowledge - knowledge achieved by taking this course are verified by the following means:

Oral exam

Test

prerequisite

Knowledge - students are expected to possess the following knowledge before the course commences to finish it successfully:

Graduation of chemistry on secondary school level.

Skills - students are expected to possess the following skills before the course commences to finish it successfully:

Students should be able to have basic laboratory skills.

teaching methods

Knowledge - the following training methods are used to achieve the required knowledge:

Lecture supplemented with a discussion

Self-study of literature

Multimedia supported teaching

Skills - the following training methods are used to achieve the required skills:

Multimedia supported teaching

Competences - the following training methods are used to achieve the required competences:

Multimedia supported teaching

learning outcomes

Knowledge - knowledge resulting from the course:

The students will obtain fundamental knowledge of structure, properties, methods of preparations and applications of metals, alloys, polymers, ceramics and composite materials.

Course is included in study programmes: