



University of Science and Technology of Hanoi
Address: USTH Building, 18 Hoang Quoc Viet, Cau Giay,
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COURSE SYLLABUS

Subject: Inorganic Materials

Academic field: Chemistry

Lecturer: Dr. Nguyen Luong Lam

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Academic year: 2017-2018

COURSE DESCRIPTION

Credit points	2 ECTS	
Level	Undergraduate	
Teaching time Location	University of Science and Technology of Hanoi	
Time Commitment	Lecture	20 hrs
	Exercise/Tutorial	hrs
	Total	20 hrs
Prerequisites	General chemistry, inorganic chemistry, and analytical chemistry	
Recommended background knowledge	General knowledge of chemistry such as principles of elements, oxides, acids, bases, chemical bonds, polarity, phase changes, phase diagrams, thermochemistry, and physical properties of matters.	
Subject description:	This course focuses on structures, basic synthesis, and applications of main classes of inorganic materials including: glasses, cementitious materials, ceramic, zeolites, solid ionic conductors, optical and photonic materials, and superconductors. Structure determination and special techniques for materials characterization will be also discussed.	
Objectives & Out-come	By the end of the course students should be able to: <ul style="list-style-type: none"> ▪ Explain structure-property relationships of the inorganic materials. ▪ Describe common methods of synthesis of solids. ▪ Describe main applications of inorganic materials. ▪ Describe common methods to determine structure of solids. ▪ Describe some special techniques for material characterization. 	
Assessment/ Evaluation	Attendance/Attitude	10 %
	Practical exercises (in class)	0 %
	Assignments (take home)	0 %
	Mid-term test (in class)	30 %



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	Final exam (comprehensive)	60 %
Prescribed Textbook(s)	[1] Materials Chemistry, Bradley D. Fahlman, 2 nd Edition, 2011, Springer	
	[2] Introduction to Material Chemistry, Harry R. Allcock, 2008, John Wiley & Sons	
	[3] Introduction to the Physics and Chemistry of Materials, Robert J. Naumann, 2008, CRC Press	

COURSE CONTENTS & SCHEDULE

Class No.	Contents	No. of Hours			Ref./Resources	Assignment(s)
		Lect.	Exr.	Prc.		
1	What is materials chemistry?	1			Chapter 1 [1]	
	Overview of the classes of materials	1			Chapter 1 (1.4, 1.5, 1.6) [3]	
	Fundamental principles that underlie materials chemistry	1			Chapter 2 [1] Chapter 2 [2] Chapter 3 [3]	
2	Binary compounds: Hydrides, borides, carbides, nitrides, and oxides. Ternary compounds and superior.	3				
3	Structure determination and special techniques for materials characterization	2.5	0.5		Chapter 7 [1] Chapter 4 [2]	
4	Midterm-test	1				
	Glasses and ceramics. Cementitious materials, zeolites	2			Chapter 2 [1] Chapter 7 [2]	
5	Glasses and ceramics. Cementitious materials, zeolites (cont.)	1				
	Superconductors	2			Chapter 11 [2] Chapter 26 [3]	
6	Solid ionic conductors	2.5	0.5		Chapter 12 [2]	
7	Optical and photonic materials	2			Chapter 14 [2]	



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Notes:

- *Abbreviation: Lect. (lecture), Exr. (Exercise), Prc. (Practise).*
- *Exercises may include assignment, reports, studentø presentation, homework, class exercises... for each class sessions.*
- *Practical mostly refer to Lab-work or outside practice such as field trip.*
- *Assignments may include assignments, practical work, reports, exercises ...for each class sessions*

Reference Literature: