SCIENCE AND TECHNOLOGY OF MATERIALS

Credits	3 **(3.2.7)**		**Course code**	CI3029	
Periods	**Total:** 60	**Theory:** 45	**Exp: 15**	**Project: 0**	**Work:** yes
Evaluation	Work: **10%**	Report: 2**0 %**	Application	Homework: **20%**	Exam: **50%**
Evaluation type	- *Midterm exam: 45 minutes* - *Final exam: 90 minutes*				
Prerequisite course					
Previous course					
Co-requisite course					
Training field	Technology of Construction Materials				
Standard	Undergraduate				
Course grade	**1**				
Other notes	*Class 3 unit / week*				

Aims of course

Introduce the field of materials science and focus on the structure, physical and chemical properties of material in construction materials. The student can recognize and specify materials such as organic, inorganic, polymer and composite.

The students have the knowledge on materials based on Conceive, Design, Implement and Operate a product on material manufacturing. The student have ability to select and design a processing.

Recognize key elements of selection of raw material, problem solving, mix design and process management in manufactory. Hence, the student can explain and introduce to material design project by communication.

Course outline

Provide students an introduction to and knowledge on science of material and manufactory. Deep knowing in structure, micro structure and property. Specification and processing. The student have ability to find out a structure and improving methodology.

Study documents

Books

[1]. Vật liệu học, Đinh Công Dưỡng, 2000.
[2]. Vật liệu kỹ thuật, Nghiêm Hùng, NXB XâyDựng, 2000.
[3]. Vật liệu kỹ thuật, Bài giảng, 2011.
[4]. Hóa lý silicat, Bùi Văn Chén, 1979

References:

[1]. Introduction of material science for engineer, James F. Shackelford, 2012
[2]. Science of materials, R. S. Khurmi, R. S. Sedha, 2008

Learning outcomes

No	Learning outcomes	CDIO
L.O.1	Apply basic science and basically knowledge on science materials	1.1, 1.3
	L.O.1.1- Remember on equation of molecular L.O.1.2- Remember on basic molecular theory L.O.1.3- Know kinetic energy equation L.O.1.4- Apply kinetic energy equation	1.1.2 1.1.3 1.3.2 1.3.3
L.O.2	Analyze relationship between energy and microstructure of materials	2.1, 2.2
	L.O.2.1- Know level of molecular on microstructure L.O.2.2- Know behavior between energy and structure L.O.2.3- Specification of microstructure	2.1.1 2.1.2 2.2.1
L.O.3	Know micro structure and property of material	2.1, 2.3
	L.O.3.1- Determine type of microstructure L.O.3.2- Know mechanical and physical property L.O.3.3- Apply mechanical and physical equation L.O.3.4- Simulate microstructure of materials L.O.3.5- Calculate microstructure	2.1.2 2.1.3 2.3.2 2.3.3
L.O.4	Show property and processing technology	1.2, 2.1, 2.3, 2.5
	L.O.4.1 – Show microstructure materials L.O.4.2 – Determine raw materials L.O.4.3 – Know processing technology L.O.4.4 – Be able to modify property of materials	1.2.1 2.1.1 2.3.3 2.3.4 2.5.2
L.O.5	Apply software to determine structure of materials	4.4, 4.5

	L.O.5.1 – Apply office software to calculate L.O.5.2 – Simulate structure with technology software	4.4.1 4.4.2 4.4.3 4.5.1 4.5.2
L.O.6	Show knowledge and presentation on structure of materials	3.1, 4.1
	L.O.6.1 – Teamwork L.O.6.2 – Presentation on structure of materials	3.1.1 3.1.2 4.1.1

Learning strategies & Assessment scheme

Total score of course includes:

- Work: 10%
- Homework: 20%
- Report: 20%
- Final exam: 50%

Instructors

- Assoc. Prof. Nguyen Van Chanh
- Assoc. Prof. Tran Van Mien
- Dr. Le Anh Tuan