

Syllabus [2025Year 2 Term]

Course Information

Course Title	Introduction to Material Science	Credits	3
Course Code	545560-1	Required/Elective (For Undergraduate Courses)	Mandatory Major
Department or Major	Convergent Systems Engineering	Language	English
Methods of Teaching		Lecture Room	화9,10,11,12,13,14(국제502)
Time Allotment	Lecture(3) Experiments(0) Trainging & Practice(0) P erformance(0) Designing & Planning(0)	Cyber Lectures	
Course Type	offline		
Cyber Lectures Preview			

Lecturer

Lecturer	Name	HUANG ZHEN GMIN	Rank	Invited Professor	Final Academic Degree	박사
	Department & college	Department of Bio and Material Engineering		Office	Seok Juseon Memorial Museum 226	
	Office Phone Number	—		e-mail	jungmin@dankook.ac.kr	
	Field of Interest					

Course Summary

Course Description	This is an introductory course of the material science. It will overview the basic concepts of constituent, properties, and application of the materials such as metals, ceramics and polymers for the next level of advanced courses in material science.
Description Related Courses	
Course Goals	It aims to learn basic concepts and professional knowledge of the physical properties and manufacturing processes of materials.
Projected Results	Students can understand the arrangement of atoms and the movement of electrons that govern the mechanical, electrical, and optical properties of materials.

Percentage of the original language classes(%)	
Cyber Lectures P review	

Syllabus

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
1	Introduction		강의,	
2	Atomic Structure and Interatomic Bonding	Understanding atomic structure and interatomic bonding	강의,	
3	The Structure of Crystalline Solids	Understanding the structure of crystalline solids	강의,	
4	Imperfections in Solids Diffusion	Understanding imperfections in solids Understanding diffusion	강의,	
5	Mechanical Properties of Metals	Understanding mechanical properties of metals	강의,	
6	Dislocations and Strengthening Mechanisms Failure	Understanding dislocations and strengthening mechanisms Understanding failure	강의,	
7	Phase Diagrams	Understanding phase diagrams	강의,	
8	Mid-term Exam			
9	Phase Transformation	Understanding phase transformation	강의,	
10	Metals and Ceramics	Understanding metals and ceramics	강의,	
11	Polymers and Composites	Understanding polymers and composites	강의,	
12	Processing of Engineering Materials	Understanding processing of engineering materials	강의,	
13	Processing of Engineering Materials	Understanding processing of engineering materials	강의,	
14	Properties of Materials	Understanding properties of materials	강의,	
15	Final Exam			

Methods of Grading

sequence	Description	Percentage	Details
1	Mid-tem Exam	30%	
2	Final-exam	30%	
3	Pop Quizzes	30%	
4	Assignments	0%	
5	Reports	0%	
6	Presentations & Discussions	0%	
7	Attendance	10%	
8		0%	
9	Others	0%	
All		100%	

Core of Value

핵심가치	전공역량	역량정의	역량구분	값(%)
혁신 (Discovery)	창의적문제해결 (Creative problem-solving)	주어진 상황과 문제를 창의적으로 해결할 수 있는 능력	부역량	0%
혁신 (Discovery)	도전 (Challenging)	전공 지식을 새로운 분야와 융합하고 아우를 수 있는 능력		0%
혁신 (Discovery)	지식융합 (Knowledge convergence)	새로운 분야를 개척하거나 도전적으로 임할 수 있는 능력		0%
헌신 (Dedication)	세계시민 (Universal value)	세계 공동체 구성원으로 전공자로서 국제적 이슈에 대응할 수 있는 능력		0%
헌신 (Dedication)	상호협력 (Cooperation)	공동의 목적 달성을 위해 타인과 상호협력을 할 수 있는 능력		0%
헌신 (Dedication)	공동체 (Sense of community)	공동체의 구성원으로서 필요한 태도와 윤리의식을 가질 수 있는 능력		0%
능동 (self-Determination)	자기주도 (Self-Managing)	주어진 상황과 문제를 주도적이고 능동적으로 해결할 수 있는 능력		0%
능동 (self-Determination)	지식활용 (Knowledge application)	주어진 상황과 문제에 대해 논리적으로 파악하고 분석할 수 있는 능력	부역량	0%

핵심가치	전공역량	역량정의	역량구분	값(%)
능동 (self-Determination)	논리적사고 (Logical thinking)	전공관련 지식을 필요에 따라 다양하게 적용하고 활용할 수 있는 능력	주역량	0%
능동 (self-Determination)	의사소통 (Articulation)	대화를 통해 다양한 의견을 조율하고 합의를 이끌어 낼 수 있는 능력		0%

Textbook(s) & References

Description	Title	Author	Publisher
Required Textbook	Materials Science and Engineering: An Introduction, 10th Ed.	William D. Callister Jr.	Wiley
Required Textbook	Callister's Materials Science and Engineering, 10th Ed.	William D. Callister Jr.	Wiley

Memo