

Syllabus [2025Year 2 Term]

Course Information

Course Title	Plastic Materials Design	Credits	3
Course Code	309590-1	Required/Elective (For Undergraduate Courses)	Selective majors
Department or Major	Polymer Science and Engineering	Language	English
Methods of Teaching		Lecture Room	화15,16,17,18(3공424-1)/ 금11,12(3공107)
Time Allotment	Lecture(1) Experiments(0) Trainging & Practice(0) Performance(0) Designing & Planning(2)	Cyber Lectures	
Credit Allotment	Lecture(1) Experiments(0) Trainging & Practice(0) Performance(0) Designing & Planning(2)		
Pre-requisite	Polymer Concepts, Polymer Concepts, Polymer Concepts, Creative Engineering Design, Creative Engineering Design		
Course Type	offline		
Cyber Lectures Preview			

Lecturer

Lecturer	Name	Cho, Junhan	Rank	Professor	Final Academic Degree	공학박사
	Department & college	School of Polymer Science and Engineering		Office	College of Engineering – Building 3 407	
	Office Phone Number	031-8005-3586		e-mail	jhcho@dankook.ac.kr	
	Field of Interest					

Course Summary

Course Description	It is the objective of this course to acquire knowledge on polymeric materials (1hour/week). Using the acquired knowledge, students are offered a basic training to design polymeric materials with tailor-made properties through structure control (2hours/week).
Description Related Courses	
Course Goals	1. To understand the relationship between structures and physical properties of various polymeric materials through the design practice on their primary and secondary structures an

	<p>d also on their bulk properties;</p> <p>2. To understand the relationship between self-assembly behaviors and physical properties of various polymeric systems through the design practice on supramolecular structures triggered by the self-assembly;</p> <p>3. To learn the basic knowledge and design skills for the development of advanced functional nanoscale materials from polymers</p>
Projected Results	Students learn the prediction of various physical properties of polymers and the design of tailor-made soft materials through basic computer-aided material design practices
Percentage of the original language classes(%)	
Cyber Lectures Preview	

Syllabus

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
1	Introduction			
2	Primary and secondary structures of polymers: polymer conformations			
3	Primary and secondary structures of polymers: polymer conformations			
4	Primary and secondary structures of polymers: conductive polymers			
5	Primary and secondary structures of polymers: conductive polymers			
6	Primary and secondary structures of polymers: hyperbranched polymers			
7	Primary and secondary structures of polymers: polymers with high performances			
8	Primary and secondary structures of polymers: engineering plastics			Midterm exam
9	Supramolecular structures/Self assembly: overview			
10	Supramolecular structures/Self assembly: block copolymers and thin films			
11	Supramolecular structures/Self assembly: designing elastomeric materials			

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
12	Supramolecular structures/Self assembly: designing ferro/piezoelectric materials			
13	Supramolecular structures/Self assembly: designing smart materials and films			
14	Review			
15	Final Exam			

Methods of Grading

sequence	Description	Percentage	Details
1	Mid-tem Exam	0%	
2	Final-exam	40%	
3	Pop Quizzes	0%	
4	Assignments	0%	
5	Reports	40%	
6	Presentations & Discussions	0%	
7	Attendance	20%	
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 상호협력할 수 있는 능력	부역량	0%

핵심가치	전공역량	역량정의	역량구분	값(%)
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	주역량	0%
능동 (self-Determination)	논리적사고 (Logical thinking)	전공관련 지식을 필요에 따라 다양하게 적용하고 활용할 수 있는 능력		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
Recommended Textbook	고분자재료	고분자재료편찬회	문운당
Recommended Textbook	Plastics Materials	Bridson	Butterworth-Heinemann
Recommended Textbook	Collection of Handouts	조준한	NA
References	Polymer Physics	Gedde	Chapman & Hall
References	Polymer Physics	Rubinstein/Colby	Oxford University Press
References	Conformational Theory of Large Molecules	W.L. Mattice/U. W. Suter	Wiley Interscience

Memo

Refer to the Korean version

Course Goal Input & Methods of Teaching and Grading

sequence	Course Goals	Methods of Teaching	Methods of Grading
no result			

Relationship between the Goal & Learnability of the Program

Goal	Achievement t1	Achievement t2	Achievement t3	Achievement t4	Achievement t5	Achievement t6	Achievement t7	Achievement t8	Achievement t9	Achievement t10
조회된 내용이 없습니다.										

Learning Achievement

검색결과는 [10 건] 입니다.

sequence	Learning Achievement
1	an ability to apply knowledge of mathematics, basic science, engineering, and information technology to the solution of engineering problems
2	an ability to analyze data and experimentally verify given facts or hypotheses
3	an ability to define and formulate engineering problems
4	an ability to apply state-of-the-art information, research-based knowledge, and appropriate tools to the solution of engineering problems
5	an ability to design systems, components and processes within realistic constraints
6	an ability to contribute to project team in the solution of engineering problems
7	an ability to communicate effectively in diverse situations
8	an ability to understand the impact of engineering solutions in the context of health, safety, economics, environment and sustainability
9	an ability to understand professional ethics and social responsibilities as an engineer
10	a recognition of the need for, and an ability to engage in life-long learning in the context of technological change

Check points about Designing & Planning

Examples of Designing & Planning	– Theme 1: design of primary/secondary structures and bulk properties of polymeric materials – Theme 2: design of supramolecular structures of polymeric materials through self-assembly	
Assignments	– Report 1: design results of primary/secondary structures and bulk properties of polymeric materials – Report 2: design results of supramolecular structures of polymeric materials through self-assembly	
Factors to Consider for Designing & Planning	<input checked="" type="checkbox"/> Setting of the Design objectives	

	jective	
	<input checked="" type="checkbox"/> Synthesis	
	<input type="checkbox"/> Analysis	
	<input checked="" type="checkbox"/> Designin g & Planning	
	<input type="checkbox"/> Productio n	
	<input type="checkbox"/> Test	
	<input type="checkbox"/> Evaluatio n of the Outpu t	
	<input type="checkbox"/> The Other s	
Limitations f or designin g & Plannin g		
	<input checked="" type="checkbox"/> Cost	
	<input checked="" type="checkbox"/> Environm ent	
	<input type="checkbox"/> Society	
	<input checked="" type="checkbox"/> Ethics	
	<input checked="" type="checkbox"/> Aesthetic s	
	<input type="checkbox"/> Health & Safety	
	<input checked="" type="checkbox"/> Productivi ty & Durability	
	<input type="checkbox"/> Industry Standard	
	<input type="checkbox"/> The Other s	