

Syllabus [2025Year 1 Term]

Course Information

Course Title	Heat and Mass Transfer	Credits	3
Course Code	376650-1	Required/Elective (For Undergraduate Courses)	Mandatory Major
Department or Major	Department of Chemical Engineering	Language	English
Methods of Teaching		Lecture Room	화12,13,14/ 목9,10,11(3공319)
Time Allotment	Lecture(2) Experiments(0) Trainging & Practice(0) Performance(0) Designing & Planning(1)	Cyber Lectures	
Course Type	offline		
Cyber Lectures Preview			

Lecturer

Lecturer	Name	Yong-Kul Lee	Rank	Professor	Final Academic Degree	공학박사
	Department & college	Institute of Advances in Science and Technology		Office	College of Engineering – Building 3 511	
	Office Phone Number	—		e-mail	yolee@dankook.ac.kr	
	Field of Interest					

Course Summary

Course Description	Heating and cooling of materials or fluid flowing through chemical apparatus, and control of heat transfer is very important. Also comprehension of heat transfer is based on operation of hydrodynamics, mass transfer. In this lecture, basic principles of heat transfer mechanism concerning conduction, convection and radiation is dealt with and those applications are treated.
Description Related Courses	* Chemical Engineering Stoichiometry : the concept of balance of mass or energy is important in the field of heat transfer. * Fluid Mechanics : understanding of fluid flow and its behavior showed in overall processes of chemical industry including heat transfer is very important.
Course Goals	

Projected Results	
Percentage of the original language classes(%)	
Cyber Lectures Preview	

Syllabus

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
1	Introduction / Heat transfer fundamentals			
2	Conduction Basic Law of Heat Conduction			Prob.10-1,2,12
3	Conduction SS/ U-SS Conduction			Prob.10-7,14,17
4	Heat flow in fluids Typical H/X			
5	Heat flow in fluids Heat transfer coeff			Prob.11-1,2,3
6	Heat transfer w/o phase change Forced convection in Laminar flow			Prob.10-7,14,17
7	Midterm exam			
8	Heat transfer w/o phase change Forced convection in Turbulent flow			
9	Heat transfer w/o phase change Forced convection in outside tube / Natural convection			Prob.12
10	HT with phase change - condensation			
11	HT with phase change vaporization			Prob.13
12	Radiation			Prob.14
13	HX equipment			Prob.15
14	Final exam			
15	Term project activity			

Methods of Grading

sequence	Description	Percentage	Details
1	Mid-tem Exam	30%	이론과 설계에 관한 중간평가
2	Final-exam	40%	이론과 설계에 관한 기말평가
3	Pop Quizzes	10%	매수업 시작 10분간 퀴즈 (출석 연계)
4	Assignments	10%	연습과제물의 평가
5	Reports	0%	
6	Presentations & Discussions	0%	연습과제물의 평가
7	Attendance	0%	수시시험과 연계
8		0%	
9	Others	10%	설계과제물의 평가
All		100%	

Core of Value

핵심가치	전공역량	역량정의	역량구분	값(%)
혁신 (Discovery)	창의적문제해결 (Creative problem-solving)	주어진 상황과 문제를 창의적으로 해결할 수 있는 능력	주역량	50%
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	부역량	30%
능동 (self-Determination)	지식활용 (Knowledge application)	주어진 상황과 문제에 대해 논리적으로 파악하고 분석할 수 있는 능력		0%

핵심가치	전공역량	역량정의	역량구분	값(%)
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	부역량	20%

Textbook(s) & References

Description	Title	Author	Publisher
Required Textbook	Unit Operations of Chemical Engineering, 7/E	McCabe, W.L.	McGraw-Hill

Memo

Class materials will be posted on the course webpage (E-learning) on Mondays.

Exams

There will be two closed-book exams: one mid-term and one final exam. You will be allowed to bring your own calculator.

The final exam will be cumulative, i.e. it will cover the complete course material.

There will be no make-up exams without documented, acceptable excuses (serious illness, family emergency).

Students caught by cheating will immediately and without exception fail the class.