

Syllabus of Spring Semester, 2018

Course Title	HEAT AND MASS TRANSFER	Course Code	CG33700	Section	062
Department	Chemical and Biomolecular Engineering Major	Level	3	Credit – Theory – Practice	3.0 – 3.0 – 0.0
Class Hours & Classroom	Mon. 10:30(75) 406-7409, Wed. 10:30(75) 406-7409				
Lecturer	Kyu Hyun	Office	301	Office Hours	Wednesday, 15:00–17:00
		Telephone		E-mail	
Methodology of Instruction	It will be taught application of vector analysis to mass and heat flux and unit operations and mechanism of the heat and mass transfer for separation process, furthermore setting of heat and mass balance and boundary conditions				
Evaluation and Grading	Exam 80% + Homework 10%+ attendance 10% * Students with disabilities can request an extension of the exam hour, and they can take exams by getting writing assistance or by using a computer.				
Prerequisites	Fluid mechanics				
Course Objectives	<ul style="list-style-type: none"> ?◦Analysis of chemical engineering operations involving heat and mass transfer. ?◦Understanding heat and mass transfer, especially in the chemical process ?◦Understanding mathematical model for heat and mass transfer. ?◦Applying mathematical model on real heat and mass transfer. ?◦Understanding convective heat and mass transfer ?◦Understanding dimensionless number. 				
Course Description	<p>The following contents are introduced</p> <ul style="list-style-type: none"> (1) Interpretation of heat transfer (2) Molecular basis of diffusion in gas, liquid, polymer, and solid (3) Condition description of diffusion in binary and multi-component mixtures with and without chemical reactions. <p>* Students with disabilities can negotiate with the Disabled Student' s Academic Support Center regarding course materials and assignments.</p>				
Relationship between Courses and Core Competencies					
8 Core Competencies of PNU					
Textbooks and References					
Required Textbooks	<ul style="list-style-type: none"> ?◦R. Welty, C.E. Wicks, R.E. Wilson, G. Rorrer, “Fundamental of Momentum, Heat, and Mass Transfer” 4th ed., John Wiley & Sons, INC. ?◦Robert E. Treybal, “Mass-transfer operation” 3rd ed., McGraw-Hill ?◦W.L. McCabe, J.C. Smith, and P. Harriot, “Unit operation” 7th ed., McGraw-Hill 				
References					

Weekly Schedule of Classes		
Week No.	Course Material	Assignments and Other Notes
Week 1	[Orientation and Education on Academic Misbehavior (e.g. Cheating, Plagiarism) and Safety Education on Experiment and Practice] Introduction to lecture & Definitions and principles	
Week 2	Heat transfer by conduction	
Week 3	Principles of heat flow in fluids	
Week 4	Heat transfer to fluids without phase changes	
Week 5	Heat transfer to fluids with phase changes	Mid exam I
Week 6	The Molecular Diffusion in Fluids (1) -Steady-state diffusion in stagnant media and in laminar flow	
Week 7	The Molecular Diffusion in Fluids (2) -Momentum and Heat transfer	
Week 8	Mass Transfer Coefficients (1) -Mass Transfer Coefficients in Laminar and turbulent flow	
Week 9	Mass Transfer Coefficients (2) -Mass, Heat and Momentum Transfer Analogies	
Week10	Mass Transfer Coefficients (3) -Simultaneous Mass and Heat Transfer	Mid Exam II
Week11	Diffusion in Solids (1) -Fick' s Law Diffusion	
Week12	Diffusion in Solids (2) -Types of Solid Diffusion	
Week13	Diffusion in Solids (3)	
Week14	Interphase Mass Transfer (1) -Equilibrium and Diffusion between phases	
Week15	Interphase Mass Transfer (2) -Material Balances	
Week16	Final exam	Final exam
Attachment		