SYLLABUS

Date: 07 . 14 . 2017 .

Course Name	Sintering Theory and Phenomena	Credit	3
Instructor	John G Fisher	Lecture Hours	Tue, Thur 5교시 (15:00-16:15)
Depart-ment	Materials Science & Engineering	Classroom	Lecture room 107
Office	Engineering Building 6 Room 315	Counsel Hours	Wednesday 11:00 am
Office Telephone		E-mail	
TA	None	Course Grade	Undergraduate 3rd / 4th year
Classifica-tion	전선	Pre-requisites	Physics, Chemistry, Materials Science

Course Overview	The fundamentals of sintering (densification and grain growth) will be explained. The basic principles of microstructre development during sintering will be given. The course can be divided into 6 parts. In part 1, the basics of sintering science will be discussed. In part 2, solid state sintering will be described. In part 3, grain growth in the solid state will be taught. In part 4, microstructure development will be covered. Part 5 will cover the sintering of ionic compounds. Finally, part 6 wiil deal with liquid phase sintering.
Lecture objectives	To teach the theory and phenomena of sintering and grain growth in ceramics.
Teaching Methods	Powerpoint lectures
Grading System	Attendance, mid-term exam, end of term exam.
References	Sintering: Densification, Grain Growth & Microstructure, Suk-Joong L. Kang, (Elsevier), materials prepared by the lecturer.

[Relation with Program Outcomes]

No.	Program Outcomes	Weight
1	수학, 기초과학, 공학의 지식과 정보기술을 응용할수 있는 능력	105
2	현실적 제한조건을 반영하여 시스템, 요소, 공정을 설계할 수 있는 능력	90
3	공학 실무에 필요한 기술, 방법, 도구들을 사용할 수 있는 능력	105

※ 해당 교과목과 관련 학습성과에 대하여 학점당 100점(1학점=100, 3학점=300)으로 표시

[Weekly Schedule]

Week	Description	Remarks
1	Introduction, sintering processes, thermodynamics of the interface	
2	polycrystalline microstructures, initial stage sintering	
3	intermediate & final stage sintering	
4	Normal grain growth & second phase particles	
5	Grain boundary segregation & grain boundary migration	
6	Interface migration under chemical inequilibrium, abnormal grain growth	
7	Midterm Exam	
8	Grain boundary energy and sintering	
9	Grain growth and densification in porous materials	
10	Sintering additives and defect chemistry	
11	Densification and grain growth in ionic compounds	
12	Basis of liquid phase sintering	
13	Grain shape and grain growth in a liquid matrix	
14	Densification models & theories	
15	Final Exam	