

Course No.	430.435	Lecture No.	001	Course Title (Subtitle)	Introduction to Electro-physics			Credit	3
Representative Instructor	Name	Jaesang Lee (post :)			Homepage	https://sites.google.com/view/snu-idsl			
	E-mail	jsanglee@snu.ac.kr			Phone No.	02-880-9093			
	Interview Time/Place :		Class: Tue/Thu 2 ~ 3:15pm; One-on-one: appointment-based						
Prerequisite Course	Semiconductor devices, Quantum mechanics, Electromagnetics								
* Course Keywords	Solid-state physics, semiconductors, crystalline structures, electronic properties of matters, quantum theory								
* 1. Purpose of Course	Korean								
	English	In this course, we will study the physics of electrons in solids, i.e., in terms of solid-state physics. As its name implies, solid-state physics is the study of the matter in solid-state phase (i.e., rigid matter). We will mainly discuss how atoms are arranged to form solids and therein how electrons behave and interact with themselves, which results in the unique properties of the practically useful solids such as metals, insulators, semiconductors, and etc. To be specific, we will learn (i) both the classical and quantum theories to explain the electrical and mechanical properties of metals, (ii) chemical bonding that holds atoms together to form solids, (iii) the structure of crystalline solids and the diffraction method to identify them, (iv) crystal vibration (i.e., phonon), (v) a band theory to identify the electronic structure of semiconductors, insulators and metals, and (vi) etc. The knowledge on these topics will allow students to understand more fundamentally the working principle behind practical applications based on solids, e.g. semiconductor electronics, superconducting and magnetic devices and etc.							
* 2. Materials and Reference	Teaching Materials: "The Oxford Solid State Basics", Steven H. Simon (Oxford University Press) Reference: "Solid-state physics", Ashcroft & Mermin; "Intro to Solid-state physics", Kittel								
* 3. Evaluation Method	Evaluation: Absolute Evaluation								
	Grading Type: A~F								
	Evaluation Items	Attendance	Assignment	Midterm	Final	Random Evaluation	Attitude	Other	Total
	Rate	10	40	25	25	0	0		100%
	Note		5 times during the semester	Presentation	Presentation				
	Attendance Policy :	Students who are absent for over 1/3 of the class will receive a grade of 'F' or 'U' for the course(Exceptions can be made when the cause of absence is deemed unavoidable by the course instructor).							
	Other:		Cheating regulation, Plan for substitute test, Availability of feedback for assignments or tests, etc.						
* 4. Quota Exceeding Course Registration	Capacity: Up to 5 Students								
5. Guideline for Students	Korean	본 과목을 수강하기 위해 선수과목을 반드시 수강하기를 권장 면담시간 및 장소 : 이메일로 약속 후 면담 상세 안내							
	English	Strongly recommend that students take the prerequisite courses before taking this course							
		Office Hours and Place: Appointment-based via e-mail							
* 6. Lecture Plan	Teaching Method Lecture-based class								
	Korean								
	English	Week 1 introduction to electro-physics Week 2 The classical theory of metals (Drude model) [HW1] Week 3 The quantum theory of metals I (Sommerfeld model) Week 4 The quantum theory of metals II [HW2] Week 5 Crystal vibration in monatomic chain							

		Week 6 Crystal vibration in diatomic chain Week 7 Crystal vibration in diatomic chain [HW3] Week 8 The Basics of band theory [Midterm presentation] Week 9 The theory of X-ray diffraction (XRD) Week 10 Band theory and semiconductors (I) [HW4] Week 11 Band theory and semiconductors (II) Week 12 Band theory and semiconductors (III) [HW5] Week 13 Organic LEDs (OLED) Week 14 Virtual reality and micro-OLEDs [Final presentation] Week 15 Invited lecture
7. Support Services for Students with Disabilities ※ You can modify these default contents.	For Lectures	☐ Visual Impairment: Make textbooks(digital textbook, braille textbook, enlarged textbook etc.), Allow note takers ☐ Physical Disability: Make textbooks(digital textbook), Allow note takers and assistants ☐ Hearing Impairment: Allow note takers and translators, Allow lecture recording ☐ Health Impairment: Excuse absence due to health problems, Allow note takers ☐ Learning Disability: Allow note takers ☐ Intellectual Disability / Autism Spectrum Disorder: Allow note takers and mentors
	For Assignments & Evaluations	☐ Visual Impairment / Physical Disability / Hearing Impairment / Health Impairment / Learning Disability: Extend assignment deadlines, Offer alternate assignment submission and response method, Extend testing period, Offer alternate testing method, Offer different testing room ☐ Intellectual Disability / Autism Spectrum Disorder: Offer individualized assignments and alternative evaluations
	Other	Students who take this course can get appropriate level of support service including the support listed above depending on the students' individual characteristics and needs through consultation with professors and the Support Center for Students with Disabilities. If you have any questions concerning support service for students with disabilities you can contact Professor Jaesang Lee (02-880-9093) or Support Center for Students with Disabilities (02-880-8787).