

Science of Materials			
Undergraduate / Graduate	Undergraduate	Registration Code	0062231
Course Category	Sciences Liberal	Credits	2.0
Term (Semester) / Day / Period	G-III (2nd year, Fall Semester) / Tue. / 2 (10:30~12:00)		
Instructor	GELLOZ Bernard Jacques		
Contact e-mail of the Instructor	Bernard.gelloz@nagoya-u.jp		
<p>●Goals of the Course This course provides students with the skills required to analyze and understand phenomena in the field of materials sciences and related interdisciplinary fields.</p> <p>●Objectives of the Course To introduce universal concepts in Science and their application to materials. To understand the relationships that exist between the structural elements of materials (microscopic properties) and their properties and performance (macroscopic properties). Students will be able to understand the origins and mechanisms of materials mechanical, electrical, thermal, magnetic, and optical properties.</p> <p>●Course Content or Plan The course begins with an introduction of the atomic and crystal structures of materials. Then, materials mechanical, electrical, thermal, magnetic and optical properties will be covered both fundamentally and technologically, according to the plan below: Atomic Structure and Interatomic Bonding; Crystal Structures Mechanical Properties; Electrical Properties; Thermal Properties; Magnetic Properties; Optical Properties</p> <p>●Course Prerequisites and Related Courses Some basic knowledge on calculus and chemistry from high school is beneficial but not necessary. Ideally, having taken related courses such as Fundamentals of Physics and Chemistry would be beneficial.</p> <p>●Course Evaluation Method and Criteria Students do not need to submit a Course withdrawal Request Form for course withdrawal. Those who are absent without valid reason from any scheduled tests will receive an "W(Absent)" grade. Evaluation will be based on class participation, midterm and final examinations. Class participation: 10%; Midterm examination: 40%; Final examination: 50%.</p> <p>●Study Load (Self-directed Learning Outside Course Hours) There is no homework. The time required outside class to prepare for examinations and understand the content will depend on how much attention is paid in class. If students follow and understand everything in class, the load outside course hours will be low.</p> <p>●How to Respond to Questions Students are encouraged to ask questions in class. Outside class, any questions may be asked using NUCT messaging or forum service, or directly by email to the instructor, or by arranging a meeting (Zoom or face-to-face).</p> <p>●Notice for Students</p> <p>●Message from the Instructor In the title of this course, there are two important words: "Science" and "Materials". The course will be very beneficial to Science/Engineering majors in multidisciplinary fields. Although the course is designed to be mostly qualitative and easy to follow, it introduces several advanced topics that will be useful for future pure physicists and engineers alike. Students from other majors will get a better understanding of the aspects of materials (constituents; structure; manufacture; costs, etc.) that may be important in their field.</p> <p>●Courses taught by Instructors with practical experience</p>			

Textbook	William D. Callister, David G. Rethwisch: Fundamentals of Materials Science and Engineering: An Integrated Approach (John Wiley & Sons).
Reference Book	William D. Callister, David G. Rethwisch: Materials Science and Engineering: An Introduction (John Wiley & Sons)
Reference website for this Course	