# Science of Materials

Undergraduate / Graduate	Undergraduate	<b>Registration</b> 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		

# •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.

# •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.

## •Course Contents 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

## •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.

### •Course Evaluation Method and Criteria

For course withdrawal student are encouraged to send a notification to the instructor using NUCT messaging. 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%.

# •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.

### •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).

### •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. The course is designed to be mostly qualitative and easy to follow, while introducing advanced universal concepts of Physics and Chemistry, which should be useful to future Physicists, engineers, chemists, biologists. 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.

Textbook	William D. Callister, David G. Rethwisch: Fundamentals of Materials Science and Engineering: An Integrated Approach (John Wiley & Sons). ISBN: 978-1-119-17550-6
<b>Reference Book</b>	William D. Callister, David G. Rethwisch: Materials Science and Engineering: An Introduction (John Wiley & Sons)
Reference website	
for this Course	

