

Course Name	Construction Material		
Semester, Year	First Semester, 2019 (Summer Term)	Number of Credits	2 credits
Course level	2000	Course Number	027028
Instructor(s) (Institution)	HENRY Michael 大学院工学研究院 Takashi MATSUMOTO 大学院工学研究院		
Course Objectives	This course is intended to provide students with a fundamental background on the production processes and basic physical properties of common civil engineering construction materials: concrete, steel, asphalt, and wood.		
Course Goals	Upon completion of this course, students should understand the applicability and selection of proper construction materials for the construction of civil infrastructure such as roads, bridges, harbors, etc.		
Course Schedule	<p>1. Introduction to construction materials The first portion of the course introduces the underlying context and basic concepts of material science and engineering necessary for studying construction materials.</p> <p>2. Cement and concrete This portion will focus on understanding the importance of concrete as a fundamental material for civil infrastructure construction. Topics include the history and domestic and international demand for concrete, cement hydration, concrete strength and structures, dimensional stability, durability, and sustainability, and how to connect basic knowledge on required performance with economical mix design.</p> <p>3. Asphalt This portion will focus on the asphalt material used in asphalt pavement. Topics include the effect of temperature and time on the elastic modulus (viscoelasticity), and discussion will be dedicated to the viscoelastic nature of all civil engineering materials, and how local climate affect material handling and construction.</p> <p>4. Steel and wood This portion will cover the steelmaking manufacturing process, steelmaking and rolling, the effects of heat treatment on the properties of steel materials, and characteristics of steel materials such as tensile strength, rolling strength, ductility, toughness, and low temperature behavior. In addition, the material properties, including orthotropic characteristics, and member design of natural wood is also covered.</p>		
Homework	It is useful for students to prepare for lectures by familiarizing themselves beforehand with the lecture contents through information and literature on construction materials. In addition, it is important to take notes during the lecture and, through re-review of the lecture contents, remember key words and terms.		
Grading System	Attendance of 2/3 of the lectures is requirement to receive credit. Students' understanding of lecture contents will be measured through submission of reports and a final exam. Both conceptual and quantitative understanding will be examined. Evaluation will be based on (1) reports: 50% and (2) final exam: 50%.		
Textbooks / Reading List			
Websites			
Website of Laboratory			
Additional Information	Printed handouts, slides, videos, etc. will also be used and distributed as necessary. English translations of the textbook materials will also be provided.		