

Course Name	Concrete Engineering		
Semester, Year	Second Semester, 2018 (Fall Term)	Number of Credits	2 credits
Course level	2000	Course Number	27095
Instructor(s) (Institution)	Takafumi SUGIYAMA (大学院工学研究院)		
Course Objectives	Concrete is widely used for constructing civil engineering structures such as highway bridges, railway bridge, seawalls, tunnels, dams, breakwaters, storage tanks, and so forth. These concrete structures must satisfy the requirements of safety and sustainability. In order to predict structural responses like the load-deformation relationship and moment-curvature relationship, basic theory and calculation methods for determining the capacity of reinforced concrete elements are studied.		
Course Goals	You should understand the properties of concrete and reinforcing steel which are the main structural components of concrete structures. You should learn the structural response of a reinforced concrete member against section forces such as bending moment, shear force and axial force and be able to calculate the flexural and shear strengths. In addition, you should learn to determine the interaction diagram of a reinforced concrete member subject to a coupled flexure and axial force.		
Course Schedule	Week 1 Introduction Week 2 Illustration of civil engineering concrete structures Week 3 Properties of concrete and reinforcing steel 1 Week 4 Properties of concrete and reinforcing steel 2 Week 5 Flexural response 1 Week 6 Flexural response 2 Week 7 Flexural response 3 Week 8 Flexural response 4 Week 9 Structural response to flexure-axial force 1 Week 10 Structural response to flexure-axial force 2 Week 11 Structural response to flexure-axial force 3 Week 12 Shear strength 1 Week 13 Shear strength 2 Week 14 Overall structural behavior of concrete structures 1 Week 15 Overall structural behavior of concrete structures 2 Week 16 Final examination		
Homework	This course is scheduled for 15 classes and final examination and consists of 90 total hours of work, including preparation and review before and after each class, respectively.		
Grading System	Submission of assignments: 30% Final examination: 70%		
Textbooks / Reading List	Handouts are distributed. Note that a Japanese textbook is suggested as well. コンクリート構造の基礎 /二羽淳一郎 :数理工学社, ISBN:4-901683-33-0		
Websites			
Website of Laboratory			
Additional Information	Knowledge on structural mechanics is recommended. Students should be aware of the University Policy about course outlines and the rules of student behavior.		