

Course Category	TBA	Credits	2
Subject Code	TBA	Taking Year	1 st Grade, 2 nd Grade
Course Title (Japanese)	凸解析・非線形関数解析	Course Period	1 st Semester
Course Title	Convex and Nonlinear Functional Analysis	Day of the week / Hour	Wednesday / The fifth period
Registration Code	TBA	Compulsory / Elective	Elective
Instructor(s)	Daishi Kuroiwa Satoshi Suzuki	Course Qualification	Students of Postgraduate Mathematics Course

Course Style	Lecture
Course Aim	We give an introduction to fundamental notions and theorems convex analysis and nonlinear functional analysis, and give an application to variational analysis and so on.
Goals and Objectives (Level of Achievement)	In convex and nonlinear functional analysis, 1. to understand basic notions, 2. to understand theorems and its proofs, and 3. to understand ideas of applications.
Course Plan	1. Introduction 2. Basic notions 3. Metric projection 4. Separation theorems 5. Gateaux differential and Frechet differential 6. Convex functions and differentiability 7. Fixed point theorems 8. Variational analysis 9. Applications 10. Quasiconvex functions 11. Quasiconvex functions 12. Nonlinear programming 13. Fenchel duality 14. Lagrange duality 15. Surrogate duality
Teaching Methods	Homeworks will be given during the course.
Key Words	Convex analysis, Nonlinear functional analysis
Texts	None
Reference Books	To be introduced in the class when necessary
Other Teaching Materials	To be given in the class when necessary
Performance Evaluation	To be decided by reports and examinations
Notes on the Course	Review the previous lecture if you could not understand.
Office Hour	To be announced
Other Notes	None