Course Category	TBA	Credits	2
Subject Code	TBA	Taking Year	1st Grade, 2nd Grade
Course Title (Japanese)	金融数学	Course Period	1st Semester
Course Title	Mathematical Finance	Day of the week / Hour	Monday / The second period
Registration Code	TBA	Compulsory / Elective	Elective
Instructor(s)	Satoshi Suzuki Daishi Kuroiwa	Course Qualification	Students of Postgraduate Mathematics Course

Course Style	Lecture
Course Aim	We give an introduction to investment science as one of the important topics of mathematical finance. The language of investment science is largely mathematical, and some aspects of subject can be expressed only in mathematical terms. The first part of the class treats deterministic cash flow streams. The second part treats portfolio optimization as one of the research aspects of single-period random cash flow streams. Three types of mathematical model for portfolio optimization will be given.
Goals and Objectives (Level of Achievement)	1. To develop the basics of investment science 2. Learn how to evaluate cash flow streams in terms of present value and internal rate of return 3. To develop mathematical models for portfolio optimization
Course Plan	1. Introduction to investment science 2. Cash flows 3. Simple and compound interest 4. Present value 5. Internal rate of return 6. Evaluation criteria for cash flow streams 7. Fixed-income securities 8. Duration and sensitivity analysis 9. The term structure of interest rates 10. Investment science and optimization 11. Single-period random cash flows 12. Portfolio optimization 13. Mean-Variance model 14. Mean-Absolute Deviation model 15. Mean-Conditional Value at Risk model
Teaching Methods	Homeworks will be given during the course.
Key Words	Mathematical Finance, Investment Science, Portfolio Optimization
Texts	D. G. Luenberger, Investment Science 2nd ed., New York, Oxford University Press, 2014.
Reference Books	To be introduced in the class when necessary
Other Teaching Materials	To be given in the class when necessary
Performance Evaluation	Evaluation is based up on final exam and class attendance.
Notes on the Course	To be announced
Office Hour	To be announced
Other Notes	None