

科目名	Course Title
数理科学特論 (Topics in Mathematical Science)	
学科・専攻	Department/Program
多元数理科学研究科	
授業形態	Class style
必修・選択の別	Compulsory or Elective
講義	
時間割コード	Registration code
1610096	開講期・曜日・時限 Semester,Day & Period
単位数	Credit
2	科目区分 Course type
担当教員	Instructor
	セルジュ リシャル(Richard Serge)
所属研究室	Laboratory
	Graduate School of Mathematics
連絡先	Contact
	richard@math.nagoya-u.ac.jp
居室	Room
	Sci. Bldg A, 237

講義の目的とねらい	Course purpose
Title : Operator theory in Hilbert spaces	
<p>This course will provide the basic notions of operators on Hilbert spaces: bounded and unbounded operators, self-adjoint operators, the spectral decomposition of self-adjoint operators. These notions will be illustrated with some examples of operators appearing in quantum mechanics or in PDE. A powerful tool of functional analysis, namely the commutator methods, will then be introduced and studied. Typical applications of these methods for spectral and scattering theory will finally be presented.</p>	
履修要件	Prerequisite
Knowledge on standard undergraduate linear algebra, calculus and advanced calculus.	
成績評価	Grading
Grades based on attendance and a written report.	
関連する科目	Related courses
他学科学生の聴講について	About attend other
<可否> 可能 <条件> This course is open for any students at Nagoya University. Motivated undergraduate students are also welcome.	
教室	Class room
Mathematics Building, room 309	

レベル	Level
2	
キーワード	Keyword
Hilbert space, self-adjoint operators, spectral theory, commutator methods.	
履修の際のアドバイス	Advice

授業内容	Content
Tentative program: 1) Hilbert space and bounded operators, 2) Unbounded operators, 3) Self-adjoint operators and spectral theory, 4) Some examples, 5) Commutator methods.	

教科書	Textbook
Lecture notes will be provided for this course.	

参考書	Recommended reading
<p>The two main references are</p> <p>1) W. O. Amrein: Hilbert space methods in quantum mechanics, 2009,</p> <p>2) W. Amrein, A. Boutet de Monvel, V. Georgescu: Co-groups, commutator methods and spectral theory of N-body Hamiltonians, 1996.</p> <p>Other references will be provided during the lectures. All material will be available on</p> <p>http://www.math.nagoya-u.ac.jp/~richard/Operators.html</p>	

連絡方法	Contact method
Anytime in my office, or by appointment made by email.	

その他	Remarks
<p>Additional information and material will be added regularly on</p> <p>http://www.math.nagoya-u.ac.jp/~richard/Operators.html</p>	