シラバス参照

開講年度/Year	2024
科目名	数学概説B
曜日・講時/Day/Period	前期 木曜日 1講時
単位数/Credit(s)	2
担当教員/Instructor	寺嶋　郁二 CAVALLINA　LORENZ 山内　卓也
学期/Semester	前期
科目ナンバリング /Course code/number	SMA-MAT802E
使用言語 /Language Used in Course	英語
メディア授業科目 /Media Class Subjects	
主要授業科目 /Essential Subjects	○

所属講座等	Faculty of Science
授業題目	数学概説B
Course Title	Mathematics B
授業の目的と概要	代数，幾何，解析からテーマを選び，それぞれの専門家が英語で解説することにより，数学とその英語による表現方法を学ぶ.
Purpose /Abstract	In this course we study several topics in advanced or basics of mathematics in Algebra, Geometry, and Analysis. Students are expected to gain a perspective of modern mathematics and how it is useful to understand mathematical phenomenon.
学習の到達目標	この講義ではいくつかのすすんだあるいは基本的な数学を学ぶ。受講生は展望と数学の有用性を理解できるだろう。
Goal	In this course, we study several topics in advanced or basics of mathematics. Students are expected to gain a perspective of modern mathematics and how it is useful to understand the mathematical phenomenon.
授業内容・方法と進度予定	ALGEBRA 1. RSA (cryptosystem) I 2. RSA (cryptosystem) II 3. Elliptic curves 4. Elliptic-curve cryptography I 5. Elliptic-curve cryptography II GEOMETRY 1. Braid groups 2. Quantum groups 3. Representations of braid groups based on quantum groups 4. Cluster algebras 5. Geometric representations of braid groups based on cluster algebras ANALYSIS　"Fixed point theorems and applications" 1. Fixed points and contraction mappings: definitions and examples. 2. The Banach Contraction Principle 3. The Implicit Function Theorem and the Inverse Function Theorem in Banach spaces 4. Iterative methods in Banach spaces 5. The solution to ODEs in Banach spaces
Contents and progress schedule of the class	ALGEBRA 1. RSA (cryptosystem) I 2. RSA (cryptosystem) II 3. Elliptic curves 4. Elliptic-curve cryptography I 5. Elliptic-curve cryptography II GEOMETRY

	1. Braid groups 2. Quantum groups 3. Representations of braid groups based on quantum groups 4. Cluster algebras 5. Geometric representations of braid groups based on cluster algebras ANALYSIS "Fixed point theorems and applications" 1. Fixed points and contraction mappings: definitions and examples. 2. The Banach Contraction Principle 3. The Implicit Function Theorem and the Inverse Function Theorem in Banach spaces 4. Iterative methods in Banach spaces 5. The solution to ODEs in Banach spaces
成績評価方法	Report and attendance
Grading	Report and attendance
教科書および参考書	No textbook assigned and we will give suitable references at each lecture
Books required /referenced	No textbook assigned and we will give suitable references at each lecture
授業時間外学習	Study relevant textbooks
Preparation and review	Study relevant textbooks
実務・実践的授業/Practical business ※〇は、実務・実践的授業であることを示す。/Note:"〇" Indicates the practical business	
その他	
Remarks	
更新日付	2024/03/14 21:01

1単位の授業科目は、45時間の学修を必要とする内容をもって構成することを標準としています。1単位の修得に必要となる学修時間の目安は、「講義・演習」については15～30時間に授業および授業時間外学修（予習・復習など）30～15時間、「実験、実習及び実技」については30～45時間の授業および授業時間外学修（予習・復習など）15～0時間です。
One-credit courses require 45 hours of study. In lecture and exercise-based classes, one credit consists of 15-30 hours of class time and 30-15 hours of preparation and review outside od class. In laboratory, practical skill classes, one credit consists of 30-45 hours of class time and 15-0 hours of preparation and review outside of class.